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THE IRON TRADE REVIEW

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CLEVELAND, OCTOBER 2, 1919
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SANDUSKY, OHIO

STEEL CASTINGS

F-C

STAFF

Advertisers' Index pages 250-251 | Contents, page 874 (Editorial) | "Where-to-Buy", page 166
Engineering Directory, pages 226-227 | Classified Advertisements, pages 234-249

The quick opening blast valve shown is operated by rack and pinion. This is the type used in the larger sizes.

The complete line covers 6" to 42" pipe diameters.

All valves are suitable for pressures of 5 to 6 pounds per sq. in.

They are seated on one side only and are very tight.

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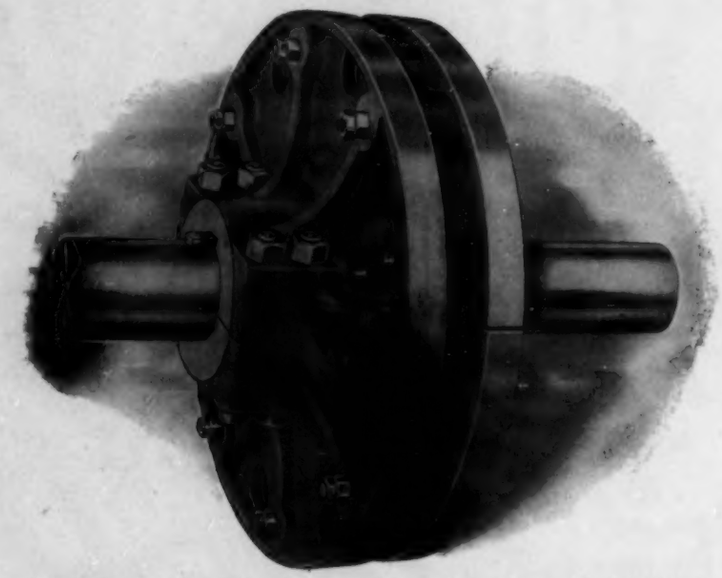
Ask for Bulletin 15-I.



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We offer a complete line of solid and flexible couplings designed for heavy duty and all accurately finished.

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The Connersville Blower Company

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THE IRON TRADE REVIEW

Vol. LXV Cleveland, October 2, 1919 No. 14

Drift of Men is Back to Works

Developments Favor Employers and Slow But Certain Progress is Being Made in Breaking Backbone of Strike—Consumers of Steel Co-operate With Mills—No Serious Dislocation of General Industry Yet Evident

SLOWLY but with clearly marked progress, the vicious assault upon the iron and steel industry by radical agitators wielded mainly through the foreign workmen, is being repelled and broken. The week's developments taken as a whole have been definitely favorable to the employers. With some large companies having various plants the actual gain in the number of men at work has averaged from 20 to 25 per cent in that period. The Pittsburgh district, the pivotal ground in the present struggle, shows a record of sustained improvement in operations while efforts of the strikers to win over certain large plants which had been running practically full from the first, have been resisted successfully. In the East the strike has lost rather than gained ground despite the much-heralded attack upon the Bethlehem Steel Co. All evidence of it practically has disappeared in the South where it has ceased to be a factor. At Chicago no serious attempt yet has been made by the steel companies to enlarge their operations and production is only slightly better. The drift of the men back to the works has begun at Buffalo. Cleveland and the Mahoning valley remain the most affected points and virtually every plant in those territories is idle. It is significant that where police protection to the workers has been most uncertain or inadequate the suspension of the industry has been the most pronounced. In some districts the employers are initiating steps to win back the men but generally they continue to pursue a passive attitude and the belief apparently is entertained that the psychological moment for this has not arrived.

Buyers Back the Mills

Consumers of steel, realizing that the issues at stake vitally concern their own interests, almost without exception are throwing their support to the producers and are refraining from pressing for deliveries or otherwise embarrassing the mills. This co-operation has simplified greatly the problem of the producers in spreading about their reduced tonnage. At the same time a prolongation of present conditions is certain to bring dislocation and distress to various lines of industry though nothing of an acute character yet has appeared. Generally the mills are accepting no new business except for indefinite delivery.

Iron Brings Premiums

While merchant pig iron production has recovered considerably in the week, especially in the Shenango valley, prompt iron is being sought by many consumers whose shipments have been cut off. This is more noticeable in consuming territory drawing upon Cleveland and Buffalo furnaces. At Cleveland buyers have paid $3 to $3.50 premium for prompt iron. Higher prices also have been paid for Buffalo iron. The principal transaction of the week was the purchase from eastern furnaces of 45,000 tons of basic at about $27.50, delivered, by the American Bridge Co. for its Pencoyd plant. This was due to the fact that this consumer's regular source of supply in the Pittsburgh district has been interrupted.

Export Sales at Record

September established a new record in the volume of export iron and steel sales. With mill output on this side now curtailed and shipping facilities reduced by the British rail and dock strike, sellers are advising buyers to hold off from further purchases at this time. Japan is inquiring for car trucks requiring about 11,000 tons of steel. The Cuban Central railroad has closed for 400 freight cars. Belgium has asked prices on 11,000 tons of pig iron but European makers undoubtedly will take this business.

Inability of many mills to keep up with contract obligations has directed a flood of business upon warehouse stocks. In some districts these supplies rapidly are being cleaned out and it is predicted that several weeks of present conditions will leave the jobbers of the country practically bare of steel supplies. Warehouse price advances have been put in effect at Boston and New York.

OCTOBER 2, 1919

THE IRON TRADE REVIEW

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Jail the Agitators

A CALM, dispassionate survey of the facts brought to light in connection with the iron and steel strike must convince any fair-minded, intelligent American that the strike is one of the greatest crimes ever perpetrated in the name of organized labor. It represents a stab in the back for an industry that is in the forefront of effort to advance the interests of the laboring man by improving human relations and insuring the man who toils just consideration and compensation.

Besides the means taken by employers to make their employes feel satisfied, other agencies were offered to employes insuring in the end impartial settlement of any grievances which they might have held. Yet swayed by influences wholly inimical to their welfare a minority of employes took a step that precluded the possibility of a settlement in their favor and attempted to put into practice a policy of rule or ruin.

A virtual mandate was issued on the President of the United States. Viewed from the standpoint of the interest of organized labor this was a most stupid blunder. The action taken by the leaders of the strike movement in the iron and steel industry has served to discredit the federation in the minds of all employers who were disposed to treat with it. Assuming those leaders will be defeated in their purpose, an assumption based on the conviction that the rights of Americans will be upheld, we may expect to hear at some future time that the federation again has become converted to sane principles and has cleaned house.

President Gompers and some of the leaders reputed to be conservative have not only condoned the strike, against which they advised, but the former publicly has set the seal of his approval on a dangerous enemy of the government. The play of politics in the federation has shown how much reliance may be placed on it in a more serious situation. The very men who have been extoled as the bulwarks of this country against bolshevism are the first to compromise with it. The spectacle of Gompers before the senate investigation committee vouching for Foster must raise doubts as to his sincerity or his judgment.

The testimony before the senate committee, revealing as it did the inner workings of the federation, proved what has long been known by employers, that the federation cannot be held to its most solemn obligations, and yet employers are criticized by the federation for refusing to compromise with it on a principle as deep-rooted as the constitution of the United States.

Arbitration as proposed by Fitzpatrick does not contemplate an agreement in regard to wages and hours for working which the federation of labor would be bound to respect, but a compromise on principle with the men of the I. W. W. type, with whom there can be no compromise. If any doubt remains in the minds of Americans as to type of men with whom the employers have been asked to compromise let them understand what is being said and done by organizers working for Fitzpatrick and Foster to undermine safe and sane government. In this issue THE IRON TRADE REVIEW presents some of the statements made by these men in public meetings. It has developed that the department of justice has had agents at their private meetings, and it is significant that the latter last week raided a meeting of bolsheviks in the heart of the strike district in East Youngstown, confidentally expecting to catch certain leaders of the federation's strike movement.

It is apparent that some connection has been established between the rankest of the radicals, the syndicalists, the Independent Workers of the World and the bolsheviks, with the active heads of the steel strike. In view of what is being said in public it would not be too much to demand that if the department of justice does not see fit to proceed against the agitators it at least submit to some responsible body such as congress the evidence that its agents have collected at the private meetings. The public itself then may judge whether some of

the self-ordained leaders of the American workingman should not be put in jail.

Teach the Workman Business Truths

WRONG conceptions of business fundamentals, confusion of gross and net incomes, and acceptance of the doctrine fostered by the radicals and the wilful disturbers that the employer's profit from a workman's daily toil is many times the latter's wage, are elements of a distorted perspective of labor that is proving one of the underlying causes of the present unrest. This perspective is being created and molded by agitators whose only hope for success lies in stirring the emotions of the ignorant and unthinking.

Individual workmen are led to believe that they earn every day from $5 to $60 for their employers and in many instances the case is "proved" by holding up the figures of gross earnings. A study of the reports of four great steel companies reveals that the net profits of each for 1918 were equivalent to between $1 and $2 a day for each employe, while in the June quarter of 1919 they were equivalent to less than $1 for each employe.

The agitator too long has been the only advocate in court. The time has come for the employer to take his side of the case to his men, for, by his indifferent silence, he is permitting them to accept the deception and the insidious doctrines of the preachers of unrest.

Refutation of the preposterous contentions of industrial disturbers, and a frank, clear explanation of the simple fundamental truths of business finance would go far in purging the air of bolshevist poison. The ardor of gullible workmen for the communistic Utopia, which they now believe would bring them riches and leisure, would vanish in a twinkling were they made to see that equal division of the fund now going to capital would net them but a few cents a day additional income.

Groups of men will ever heed the call of leadership. It remains for employers to provide healthy, enlightened mutually helpful leadership from within, or see the allegiance of employes drift into the camp of radical, outside agitators. Where an honest desire to treat men fairly and squarely exists, nothing is to be lost by laying the cards upon the table before them; indeed everything is to be gained by such a course.

Questions Which Need Answers

ON AUG. 8, the government issued an inventory of 1036 tools with fixed prices based on their service value. The list included machines from three divisions; the aircraft service, the motor transport service and the general ordnance department. It is understood that the tools belonging to the three bureaus were to be pooled and that instructions were issued that the latter were to cooperate with each other in expediting the marketing of the federally-owned equipment. Each was to be able to offer and sell the others' machines.

How this very excellent plan, the result of weeks and months of study and consideration by the machine tool section of the war industries board at Washington, is working out, is a matter about which little is being heard. The inventory as issued embraced the necessary data in convenient form, giving the size, number, type, price and condition of each tool with its location. Notwithstanding this fact, efforts by dealers to buy various tools have resulted in practical failure. The way the proposition apparently is being handled but emphasizes the lack of business-like methods, described on page 337 of the Aug. 7 issue of this publication in an article which was inspired by the widespread indifference among tool buyers toward government-owned machines.

A few weeks ago a prominent new and used machinery dealer, in the Middle West endeavored to purchase some federally-owned equipment. He describes his experiences as follows, the type of machine mentioned being substituted:

> We found three 42-inch vertical boring mills listed in the government's inventory and immediately endeavored to purchase them from our local ordnance department for our customer, who needed them immediately. The ordance department ascertained by wire that but two of the tools were available. Our order with certified check was sent. A telegram stating that the tools were sold brought a further wire from the air service division stating that neither of them could be located. Notwithstanding all our efforts to obtain the tools, we were unsuccessful.

Is it to be taken for granted that certain army officers have been entrusted with the highly important duty of disposing of the government's equipment? Can it be that through fear of working themselves out of their jobs, these officers are unfair to the government and its people in general and its machine tool industry in particular? Can it be possible that one division refuses to sell through another, simply because the bureau which made the sale would receive the credit for it and the one holding the title to the equipment would not?

These are questions which are running through the minds of those who have made efforts to consummate deals with these governmental agencies. They are questions which should be met and answered by the several departments in question before they can hope to be successful in their effort to dispose of the government-owned machinery which now has been idle over 10 months.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 948 AND 950

Pig Iron

Bessemer, valley	$27.95
Bessemer, Pittsburgh	29.35
Basic, valley	25.75
Basic, Pittsburgh	27.15
Basic, delivered, eastern Pa.	27.50
Basic, Buffalo, furnace	26.75
Malleable, Pittsburgh	28.65
Malleable, Chicago, furnace	27.25
Malleable, Buffalo, furnace	27.25 to 29.00
Malleable, delivered eastern Pa.	30.00 to 32.90

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$31.35 to 32.85
No. 1 foundry, Chicago furnace	28.00
No. 2, foundry valley, Pittsburgh	28.15
No. 2 foundry, Buffalo	26.75 to 28.50
No. 2 Northern, Boston	32.40
No. 2 foundry, Cleveland furnace	27.25
No. 2 foundry, Ironton furnace	28.00
No. 2 foundry, Chicago furnace	26.75
No. 2X, eastern del., Phila.	31.35 to 32.35
No. X, eastern, N. J. tidewater	31.35 to 32.35
No. 2X, eastern, Boston	32.90
No. 2X foundry, Buffalo furnace	28.00 to 29.50
No. 2 foundry, del., Philadelphia	30.10 to 31.10
No. 2 foundry, N. J. tidewater	30.10 to 31.10
No. 2 southern, Birmingham	26.75 to 27.50
No. 2 southern, Cincinnati	31.35 to 31.60
No. 2 southern, Chicago	31.75 to 32.50
No. 2 southern, Phila.	33.25 to 34.00
No. 2 southern, Cleveland	31.75 to 32.50
No. 2 southern, Boston	35.50 to 36.00
No. 2 southern, St. Louis	31.00 to 31.75
Virginia, No. 2X, furnace	30.00
Virginia, No. 2X, Philadelphia	34.10
Virginia, No. 2X, Jersey City	34.40
Virginia, No. 2X, Boston	34.70
Gray forge, valley, Pittsburgh	27.15
Gray forge, Buffalo	26.25 to 28.00
Gray forge, eastern Pa.	28.50 to 29.00
Silveries, 8%, furnace	40.25 to 43.00
Ohio Silveries, 8%, Chicago	44.05 to 46.80
Tennessee Silveries, 8%, Chicago	48.65
Low phos. standard, Phila.	39.80 to 41.80
Low phos. Lebanon, furnace	35.00
Low phos. standard, Pittsburgh	39.00 to 40.00
Charcoal, Superior, Chicago	32.75
Charcoal, Superior, Chicago first quarter 1920	33.75

Coke

(At the ovens)

Connellsville furnace	$3.50 to 4.00
Connellsville foundry	5.50 to 6.50
Pocahontas furnace, nominal	5.75 to 6.00
Pocahontas foundry, nominal	6.50 to 7.00
New River foundry, nominal	8.50 to 9.50
New River furnace, nominal	7.50
Wise county furnace, nominal	5.75 to 6.00
Wise county foundry, nominal	7.50 to 8.00

Ferroalloys

Ferromanganese, 80 per cent, delivered producers' price	$110.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	nominal
Spiegel, 18 to 22 per cent furnace, spot	35.00
Ferrosilicon, 50 per cent, spot and contract, delivered	85.00 to 90.00
Ferrotungsten, standard, per pound contained, furnace	1.20 to 1.30
Ferrochrome, 60 to 70 per cent chromium, 4 to 6 per cent carbon, per pound contained, maker's plant	28 to 30 cents
Ferrovanadium, 35 to 40 per cent, per pound contained, according to analysis	$6.00 to $7.50
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	49.75
Bessemer, ferrosilicon, 11 per cent	53.05
Bessemer, ferrosilicon, 12 per cent	56.35

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	$38.50
Open-hearth, Philadelphia	42.50
Open-hearth, Philadelphia	38.50
Bessemer, Pittsburgh	38.50
Bessemer, Youngstown	38.50
Forging, Pittsburgh	51.00
Forging, Philadelphia	55.00

SHEET BARS

Open-heath, Pittsbugh	$42.00
Open-hearth, Youngstown	42.00
Bessemer, Pittsburgh	42.00
Bessemer, Youngstown	42.00

SLABS

Pittsburgh and Youngstown	41.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c
Structural shapes, Philadelphia	2.695c
Structural shapes, New York	2.72c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.65c
Tank plates, Chicago	2.77c to 2.92c
Tank plates, Philadelphia	2.745c to 2.895c
Tank plates, New York	2.77c to 2.92c
Bars, soft steel, Pittsburgh	2.35c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c
Bars, soft steel, Philadelphia	2.595c
Bar iron, common, Phila.	2.595c to 2.745c
Bar iron, common, Chicago	2.62c
Bar iron, common, Cleveland	2.52c
Bar iron, common, New York	2.62c to 2.77c
Bar iron, common, Pittsburgh	2.75c
Hard steel bars, Chicago	2.55c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	40.00 to 45.00
Relaying rails, Pittsburgh	39.00 to 41.00
Angle oars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	$2.10 to 2.45
Spikes, railroad, Pittsburgh	3.35c
Track bolts, Pittsburgh	4.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers 5c more)

Wire nails, Pittsburgh	3.25c to 3.50c
Plain wire, Pittsburgh	3.00c to 3.10c
Galvanized wire, Pittsburgh	3.70c to 3.80c
Barbed wire, painted, Pitts.	3.40c to 3.50c
Barbed wire, galvanized, Pitts.	4.10c to 4.20c
Cut nails, Pittsburgh l. c. l.	5.045c
Coated nails per count keg, Pitts.	2.85c to 3.10c

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Polished staples, Pittsburgh	3.40c to 3.50c
Galvanized staples, Pittsburgh	4.10c to 4.20c

Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	5.75c
Sheet piling, base, Pittsburgh	2.55c

Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100 inch and heavier, base per 100 pounds, 5.65c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c
No. 28, bessemer, Pitts.	5.70c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c
No. 10, bessemer, Pitts.	3.55c
No. 10, open-hearth, Chi.	3.82c
No. 10, open-hearth, Phila.	3.795c

Full sheet schedule page 950.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
¾ to 3 in., butt, steel	57½	44
⅜ to 3 in., butt, iron	39½	23½

Full pipe schedule page 950.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40½
Iron, 3½ to 4½ inches, c. l.	16

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B.

Four-inch, Chicago	$62.80
Six-inch and over, Chicago	59.80
Four-inch, New York	59.30
Six-inch and over, N. Y.	56.30
Four-inch, Birmingham	51.00
Six-inch and over, Birmingham	48.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c
Bands, Pittsburgh	3.05c
Hot rolled strip steel, Pitts. stamping quality	3.30c
Cold finished steel bars, Pitts., base	3.60c

Cotton ties, lots of 1000 to 3000 bundles, $1.76½ per bundle, mill.

Cotton ties, 3000 bundles and over, $1.74½ per bundle.

Rivets

Structural rivets, Pittsburgh	3.90c
Boiler rivets, Pittsburgh	4.00c
Rivets ⅞ in. and smaller Pitts.	60–5 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅝ x 6 inches, smaller and shorter)

Rolled thread	50–10 off
Cut thread	50 off
Larger and longer	40–5 off

MACHINE BOLTS

(⅝ x 4 inches, hot pressed nuts)

Rolled thread	60 off
Cut thread	50–10 off
Larger and longer	45–5 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	70 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	75–5 off
Gimlet and cone point lag screws	60 off

NUTS

Hot pressed, square blank	2.70c to 3.10c off
Hot pressed, square tapped	2.45c to 2.85c off
Hot pressed, hexagon blank	2.70c to 3.10c off
Hot pressed, hexagon tapped	2.45c to 2.85c off
Cold pressed, square tapped	2.45c to 2.85c off
Cold pressed, square blank	2.70c to 3.10c off
Cold pressed, hexagon blank	2.70c to 3.10c off
Cold pressed, hexagon tapped	2.45c to 2.85c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices Oct. 1, 1919	Average prices Sept. 1919	July 1919	Oct. 1918
Bessemer, valley, del., Pittsburgh	$29.35	$29.35	$29.35	$36.60
Basic, valley, delivered, Pittsburgh	27.15	27.15	27.15	34.40
*No. 2 Foundry, Pittsburgh	28.15	28.15	28.15	35.40
*No. 2 Foundry, Chicago, furnace	26.75	26.75	26.75	34.00
Lake Superior charcoal, Chicago	32.75	32.75	31.75	38.70
Malleable, valley	27.25	28.65	28.65	35.90
Malleable, Chicago	27.25	27.25	27.25	34.50
*Southern, No. 2, Birmingham	26.75	26.75	25.00	35.25
*Southern Ohio, No. 2, Ironton	26.75	26.75	26.75	34.00
Basic, eastern del., eastern Pa	27.50	27.00	26.50	36.60
**No. 2X, Virginia, furnace	30.00	29.25	26.50	37.50
*No. 2X, eastern del., Philadelphia	31.25	29.95	29.50	38.85
Gray forge, valley del., Pittsburgh	27.15	27.15	27.15	34.40
Ferromanganese, 80 per cent, delivered	110.00	105.00	112.00	250.00†
Bessemer billets, Pittsburgh	38.50	38.50	37.30	47.50
Bessemer sheet bars, Pittsburgh	42.00	42.00	40.80	51.00
Open-hearth sheet bars, Pittsburgh	42.00	42.00	40.80	51.00
Open-hearth billets, Pittsburgh	38.50	38.50	37.30	47.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, Chicago	2.02	2.02	2.02	3.17
Iron bars, Philadelphia	2.595	2.595	2.595	3.73

	Prices Oct. 1, 1919	Average prices Sept. 1919	July 1919	Oct. 1918
Iron bars, Cleveland	$2.52	$2.52	$2.52	$3.64
Iron bars, Chicago mill	2.62	2.62	2.62	3.50
Beams, Chicago	2.72	2.72	2.72	3.27
Beams, Pittsburgh	2.45	2.45	2.45	3.00
Beams, Philadelphia	2.695	2.695	2.695	3.23
Tank plates, Pittsburgh	2.65c	2.55	2.65	3.25
Tank plates, Chicago	2.92	2.92	2.92	3.52
Tank plates, Philadelphia	2.895c	2.845	2.895	3.48
Sheets, blk., No. 28, Pittsburgh	4.35	4.35	4.31	5.00
Sheets, blue anid., No. 10, Pittsburgh	3.55	3.55	3.51	4.25
Sheets, galv., No. 28, Pittsburgh	5.70	5.70	5.66	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Connellsville furnace coke	3.85	4.65	4.00	6.00
Connellsville foundry coke	6.25	5.90	4.90	7.00
Heavy melting steel, Pittsburgh	20.50	20.50	19.90	29.00
Heavy melting steel, eastern Pa	19.00	19.00	18.85	28.50
Heavy melting steel, Chicago	18.50	19.10	19.40	29.00
No. 1 wrought, eastern Pennsylvania	27.00	27.00	24.70	34.00
No. 1 wrought, Chicago	21.00	21.25	21.20	33.50
Rerolling rails, Chicago	25.00	25.50	24.70	34.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

Corporation Buys Basic in East

American Bridge Co. Cut Off From Regular Pittsburgh Supply Closes For 45,000 Tons at About $27.50 Delivered—Spot Iron in Demand and Premiums up to $3.50 are Paid—Furnaces Resume

Philadelphia, Sept. 30.—A sweeping change has developed in the eastern basic market by reason of large purchases of the grade by American Bridge Co. Unable to get its usual shipments from the Pittsburgh district, this interest has purchased 45,000 tons all for spot and nearby delivery from eastern makers. Various prices paid for this iron establish the market at $27.50 delivered Pencoyd and other eastern Pennsylvania points. However these purchases thoroughly have cleaned up supplies so that it is doubtful whether the price could be duplicated. One maker who expects to have basic for market in month or two says he would not sell less than $28 furnace and another will not sell at less than $30 furnace. Foundry iron by reason of the fact that the furnaces all are well sold up also is much stronger. The minimum in eastern Pennsylvania now is $30.25 furnace No.for No. 2X (2.25 to 2.75 silicon) and $29 for No. 2 plain (1.75 to 2.25 silicon. The central Pennsylvania group is $29.50 furnace for No. 2X but as high as $31 and $32 eastern Pennsylvania furnace is being done on No. 2X. The strike situation in Buffalo is enabling some sellers having stock iron there to obtain from $29 to $30.25 Buffalo for No. 2X for spot shipment to New England. Fair amount business is being done in foundry iron. It includes some lots of 1000 tons or more but is made up mostly of smaller tonnages most of it is for this year as on next year, most furnaces yet are unwilling to quote. Some makers are asking as high as $33 eastern Pennsylvania furnace on No. 2X for first quarter and first half. Virginia iron being sold by one maker at $30 furnace for No. 2X. Western consumers are paying high prices for high silicon Virginia based on $26.75 furnace for No. 2 plain plus differentials. Virginia high silicon now is practically sold up. Low phosphorous sales include one lot of 100 tons of standard iron and two lots copper-bearing totaling 500 tons. Low phosphorus prices are unchanged.

Strike Cuts Off Orders

Boston, Sept. 29.—Steel strike conditions together with the withdrawal of most of the offers of 1920 pig iron from the New England market have caused a decided drop in sales during the past week. Several of the Buffalo furnaces are so seriously affected by strike conditions that no orders at all are being accepted. In the case of two furnaces all deliveries have stopped, due to the fact that railroads will not take cars which stand loaded in the yards. Eastern Pennsylvania furnaces however have not been affected, except indirectly, and iron for the last quarter has been sold in about the normal amount. Only a few small furnaces are offering any 1920 iron and the prices in these cases are from $1 to $1.50 above this year. An eastern Massachusetts machine tool manufacturer bought 200 tons of 2X eastern (2.25 to 2.75 silicon) at $31 eastern Pennsylvania furnace, for first quarter and other sales for 1920 have been made at practically the same delivered price. Greater activity has been reported from the Virginia district and many small sales for prompt shipment and last quarter have been made. The price in most cases has been $30 furnace for No. 2X (2.25 to 2.75 silicon). The Virginia Iron, Coal & Coke Co. is quoting $30 on both 1.75 to 2.25 silicon and 2.25 to 2.75 grades. Some Alabama iron has been sold to New England consumers during the week at the level established two weeks ago. No large tonnage orders have been reported from any section although the Draper Corp. has been known to have closed for part of its requirements at least and to have further inquiries out. One Massachusetts consumer bought 1000 tons of No. 2X eastern (2.25 to 2.75 silicon) for last quarter at $32.90 delivered. The Whitin Mfg. Co., Whitinsville, Mass., placed orders for part of its requirements of 4000 tons and the Walworth Mfg. Co., Boston, is understood to have bought 1000 tons of malleable. Prompt iron is becoming scarcer. Total sales of the week through New England representatives are estimated at 8000 tons.

Forward Demand is Active

New York, Sept. 30.—Although practically none of the eastern furnaces has opened books for delivery after Jan. 1, the inquiry for such shipment is growing steadily, and the makers in most cases have been requested to notify numerous customers as soon as they are ready to take such business. Sales for deliveries after this year still are exceptional. The furnaces do not desire to make contracts for forward delivery until the present strike has come to an end. The only effect of the strike on the eastern pig iron market so far has been the crippling of the Buffalo district, which is preventing certain furnaces there from making shipments. The furnaces also are still too much in the dark as to their future costs for them to sell large tonnages ahead. Only one eastern furnace has been a forward seller during the past week. This interest, a Lehigh valley maker, has sold several thousand

tons of foundry iron for first quarter at $30, furnace, for 1.75 to 2.25; $31, furnace, for 2.25 to 2.75, and $32, furnace, for 2.75 to 3.25 silicon. Most of the business involved foundry iron for spot and nearby shipment. Numerous sales were included, most of them ranging from a carload to a few hundred tons. Several lots of 1000 to 2000 tons also were included. The biggest transaction involved 5000 tons which the Crane Co., Bridgeport, Conn., bought for delivery over the rest of this year. A feature of the business in foundry iron during the past week has been the ability of sellers to obtain higher prices for the rest of this year. Several sales were made by eastern Pennsylvania furnaces at $31 and $32, furnace, for 2.25 to 2.75 silicon.

Little Doing Except in Foundry Iron

Pittsburgh, Sept. 30.—Practically the only activity that is noted in the pig iron market is in foundry grades, though there have been rumors that some of the steel manufacturers whose blast furnaces are banked as a result of the defection of common labor, have been looking around for bessemer and basic. The National Transit Co., Oil City, Pa., recently closed on 3800 tons of foundry, part of which was No. 2X (2.25 to 2.75) and part No. 3 (1.25 to 1.75), the business being placed at regular market prices or $28 for No. 2X and $25.75 furnace for No. 3. The Westinghouse Machine Co. also has closed on its last quarter requirements of foundry but details as to tonnages, grades and prices are not available. The Standard Sanitary Mfg. Co. which recently put out an inquiry for 1000 tons of foundry, equally divided between No. 2X and No. 2 grades for its Louisville, Ky., plant has not yet closed. Foundries not much disturbed by the steel plant strike are pressing furnace interests for deliveries against contracts and in addition a number of inquiries have come from melters in doubt about getting shipments against contracts. One seller reports inquiries aggregating more than 5000 tons. From an operating standpoint the situation is much improved. While the furnace of the Weirton Steel Co., for the present a merchant stack is down, practically all of the merchant producers in the Shenango valley again have their furnaces blowing. Two of the stacks of the Shenango Furnace Co., at Sharpsville, Pa., and the Sharspville Furnace located in the same place, operated by Allen S. Davison & Co., Pittsburgh, are banked, these being the only inactive furnaces in that section.

Spot Iron Brings Premiums

Cleveland, Sept. 30.—Spot iron is in sharp demand from consumers in this district due to the shutting off of shipments from various furnaces banked because of the strike and premiums are being paid. Southern Ohio iron has been sold in this district at $29.75 furnace for 1.75 to 2.25 silicon, equivalent to $32.35 delivered. This represents a premium of $3 to $3.50 over the previous market. One maker has been disposing of misfit grades but has asked no premium and is selling at the usual differentials under the base price. No iron is being shipped from the four furnaces of the McKinney Steel Co. or the two stacks of the Cleveland Furnace Co. this city, all of which continue banked. Some of the furnaces report difficulty in getting out iron from the yards because of car shortages and the rush of ore shipments. Stocks of those furnaces which are able to ship are being cleaned up more rapidly under prevailing conditions. Various steel plants which have been closed or crippled by the strike continue to hold up shipments of basic. Notwithstanding this fact one of the largest interests with headquarters here reports that its shipments in September were the heaviest of the year. Some selling for 1920 continues but it is limited. One maker in addition to a 6000-ton lot of foundry iron reported previously took about 4000 tons in the week, for that delivery.

Prompt Iron in Demand

Chicago, Sept. 30.—With merchant stacks in Chicago completely out of service deliveries of pig iron have ceased and even iron on yards at furnaces is not being loaded and shipped. Melters generally have sufficient supply to care for immediate needs and are not worrying about the future in this respect. However, prompt iron on wheels from south and east is finding ready sale and moves as soon as offered, even at much higher price than local iron has commanded. A southern seller is offering last quarter iron for $28, Birmingham, for silicon 1.75 to 2.25 and $29.10, Birmingham, for silicon 2.25 to 2.75, though the latter grade is rather scarce. The same interest is offering first quarter delivery at $28.50, Birmingham, for silicon 1.25 to 1.75, $29 for the next silicon grade, $30.10 for 2.25 to 2.75 and $31.20 for silicon 2.75 to 3.25. A Tennessee producer of silveries is nearly sold out for 1919 delivery and has not opened books for 1920. The present schedule for silveries from this producer is $39.75 for 6 per cent, $41.25 for 7 per cent and $2 additional for the next two steps. Freight is $3.40 to Chicago.

Take 1920 Business at $28

Cincinnati, Sept. 29.—A considerable tonnage of foundry iron for nearby shipment is changing hands. Sales for delivery this year are being made in territory ordinarily supplied by some of the lake furnaces that are closed on account of the strike. A few southern furnaces have quietly taken on some first quarter business at $28, Birmingham, for 1.75 to 2.25 silicon, and at $29.10 for 2.25 to 2.75 silicon. However, most of the furnaces seem to have set $30 as minimum for next year's business, based on 1.75 to 2.25 silicon. Practically all of the spot iron offered in the Ironton district at $27.50 for 1.75 to 2.25 silicon has now been disposed of, so that $28 now seems to be minimum in that field.

Speeding Up Production in South

St. Louis, Sept. 27.—The local pig iron market has not felt the affects of the strike. Foundries and mills are operating as heretofore, and most of them are likely to continue doing so, for the reason that the greater part of supplies used in this district are drawn from southern furnaces. Selling agencies of southern makers report that their principals are preparing to speed up production. Northern shipments are slowing up, and the same is true of consignments from the East. Consumers are buying all the iron they can get, and demand for prompt shipment is the best it has been in a number of weeks. It is understood several leading foundry interests have offered liberal premiums. The opening of books by southern furnaces for 1920 business will be indefinitely delayed.

Southern Market Satisfactory

Birmingham, Ala., Sept. 30.—The pig iron market in the South is in a satisfactory condition. There is a steady demand, and inquiries are in hand for a large tonnage for 1920 delivery. The attempt at a strike of the iron and steel workers at plants of the Tennessee Coal, Iron & Railroad Co., and the American Steel & Wire Co., was a failure and did not in the least affect production of pig iron. The output of iron in Alabama in September will show an increase in comparison with August. Prices have been firm, on a basis of $28 for No. 2 foundry (1.75 to 2.25 silicon). General selling into 1920 will probably be noted within the next two to three weeks. Inquiries received indicate there would be no strong resistance by buyers to a price of $30 per ton. Furnace companies are convinced that there will be a demand for every ton of pig iron that can be manufactured.

Stocks Droop

Warehouses Undergo Heavy Demand —Prices Raised

Cleveland, Sept. 30.—Warehouse stocks in Cleveland are being cleaned out rapidly under the sharpened demand from consumers which has been caused by the strike. Some of the largest local interests now are without supplies to meet the requests coming in upon them and are refusing many orders. The Carnegie Steel Co. is limiting individual warehouse orders as a general rule to three tons. Some local consumers have been obliged to go to Chicago to fill their needs.

Boston Prices Up

Boston, Sept. 30.—Warehouse prices are rapidly stiffening owing to the slower delivery from the mills. Galvanized sheets No. 28 gage have been advanced to 7.50c from 7.10c, and No. 28 black to 6.15c from 5.90c.

Blue Annealed Advanced

New York, Sept. 30.—An advance of 25 cents in blue annealed sheets, effective today has been announced by a leading warehouse interest here. The new price is $4.82 per 100 pounds, New York. This increase follows a heavy demand, which, as a matter of fact, extends to bars. Structurals and plates also are moving in better volume than heretofore.

Fall Back on Stores

Chicago, Sept., 30.—With current delivery of finished steel considerably interfered with by the strike, much structural material is being sought

from the steel warehouses, the difference in price not being counted against the convenience of obtaining material promptly. This applies not only to routine lots for small construction needing only a few pieces, but to larger supplies which are being taken for structures which usually would be bought through the mill. As a result of the strike condition, warehouse business is noticeably heavy.

No Orders

Being Taken by Makers of Wire Products—Eastern Output Good

New York, Sept. 29.—Although considerable of the wiremaking capacity of the country has been rendered idle by the strike, the industry is by no means prostrated. This is particularly true in the east where all the wire mills are operating at the same rate as before the strike was called and have not been interfered with in filling their orders.

Makers Out of Market

Pittsburgh, Sept. 30.—Manufacturers of wire and wire products are out of the market as far as new business is concerned, curtailment of production resulting from the strike permitting of no other course as far as the leading interest is concerned. The Pittsburgh Steel Co. plant and those of the Cambria Steel Co. and the Youngstown Sheet & Tube Co. are down. The Jones & Laughlin Steel Co. thus far has been unaffected in most departments by the labor distubances and its wire mills are among that part of the works which is running regularly.

Reduced Output

In Semifinished Material Well Balanced by Lighter Consumption

Pittsburgh, Sept. 30.—Production of billets, sheet bars and other kinds of semifinished steel has suffered from the suspensions brought about by the strike, but probably no more so than finishing mill capacity and as a result few of the active rolling mills are suffering for want of supplies. Some demand is coming to makers of billets and sheet bars from finishing mills whose regular sources of supply are cut off, but such inquiries are not receiving much attention at the moment.. Inquiry for 1000 tons of standard bessemer billets is noted from a Pittsburgh maker of tool steel. Few wire rods are available on the open market at present.

Strip Makers Operating

Pittsburgh, Sept. 30.—Most of the makers of strip steel in this district have been unaffected by the strike as far as the loss of men is concerned and are running full. Little effort is being made to secure new business as current bookings probably will absorb production over the remainder of the year.

Coke Prices are Reduced

Large Tonnages Thrown Back on Producers by Suspension of Blast Furnaces — Standard 48-Hour Beehive Sold at $3.50

Pittsburgh, Sept. 30.—Anxiety on the part of beehive coke producers to find an outlet for tonnages thrown back on their hands as a result of the suspension of blast furnaces, due to the strike, has resulted in sharply lower prices than recently prevailed. While some merchant blast furnaces have resumed they appear to have had considerable supplies of coke both on hand and on wheels and have not been buying coke or ordering a resumption of shipments against contracts. The only outlets, therefore, have been to consumers who are in a position to stock some tonnage, or for export. Sales involving about 8000 tons are reported for export, and a fair amount of coke has been bought for stocking, but the combined business has made only a small dent in the accumulated supplies. The result is a dull and unsettled spot situation with prices largely in favor of buyers. As low as $3.50 has been done on loaded cars of standard 48-hour beehive coke and there is no basis in sales for a price on this grade of higher than $4, although a few of the larger producers continue to quote as high as $4.75. Two sales of 100 cars each were $3.85 ovens. Spot sales of by-product furnace coke are reported as $3.75. The Carnegie Steel Co. is managing to keep its Clairton by-product plant running about 75 per cent of capacity, and is producing enough coke to meet the requirements of the blast furnaces ordinarily served by these ovens. A number of the ovens of the H. C. Frick Coke Co., are inactive, because of the relatively full operations of the Clairton plant. No contract business is being done in furnace coke and quotations merely are nominal. A little foundry coke might be picked up at $5.50, ovens, but in general, the market on this grade has not been much affected by the strike and basis in sales still exists for a quotation as high as $6.50. The *Connellsville Courier* estimates coke production for the week ended Sept. 20, at 258,801 tons, against 259,900 tons in the previous week.

Foundry Coke Prices Firm

Cincinnati, Sept. 29.—The expected increase in production in the Connellsville district, as compared with consumption, is not up to estimates made a week ago. More foundry coke is being turned out because of the reduced consumption of furnace coke, but on account of the car shortage the fuel is not moving very fast. No effect on foundry prices is noticed and leading interests continue to quote from $6 to $6.50 per ton, ovens. New River and Pocanhontas are both scarce, although some spot foundry sales are made in the last named field. Wise county producers are making a little headway in catching up on shipments, and some spot foundry coke is also available in that district. New River foundry coke is still as high as $9 to $9.50. Wise County and Pocahontas foundry grades range from $7.50 to $8 at ovens.

Expect Prices to Drop

Boston, Sept. 29.—Foundry coke consumers in New England are looking for a drop in prices as a result of excess production of beehive fuel because of the steel strike. Most of the foundries however have contracts covering their requirements throughout this year, and Connellsville coke, however low it may go, is not expected to come into the New England market in quantity. A lower price on Connellsville coke throughout the present week will have the effect of bringing down the October schedule on sliding scale contracts for by-product coke., Much of the tonnage is, however, on a flat rate basis. Coke producers say that new contracts on a flat rate basis will not be lowered, and first half coke is being held at $11.90.

Demand at St. Louis is Good

St. Louis, Sept. 27.—One effect of the steel strike in this district has been to improve coke receipts from eastern ovens. For weeks consumers have complained of delayed deliveries, due to the car shortage. The suspension of blast furnaces in the East has released a large number of freight cars, which are being loaded with coke and sent to western destinations. One dealer received more coke in two days this week than in 10 days preceding. Demand is excellent, especially for foundry coke.

Heavy Demand

For Stock Tin Plate Caused by Strike —Operations Favorable

Pittsburgh, Sept. 30.—The effect of the strike on the tin plate market has been to sharply stimulate the demand for stock plate and some manufacturers report no difficulty in making sales of this grade at $7 per base box, Pittsburgh. Comparatively few plants have suffered much as a result of the strike, several of the independents having kept going owing to the fact that they were working under agreements with the Amalgamated association, whose members are not subject to the strike call. These agreemets, however, were not sufficient to enable some plants to keep in operation. The American Sheet & Tin Plate Co., having a number of its works in isolated places, did not suffer much. The Cambridge works of the American Sheet & Tin Plate Co., Cambridge, O., and the Chester works, Chester, W. Va., have been running full throughout the strike, and the interruptions at the Farrell works, at the New Castle works and the Shenango works were short-lived, all of these plants having had steady accession to working forces after the first day of the strike and today the Shenango works are running 90 per cent full.

Ford Awards Big Tonnage

Places 20,000 Tons With American Bridge Co. For Detroit Plant Extensions—Structural Lettings Keeping up in Good Tonnage

Pittsburgh, Sept. 30.—One of the largest structural contracts awarded in some time has been taken by the American Bridge Co. It involves 20,000 tons of material for a group of foundry buildings for the Ford Motor Co. at its new River Rouge plant near Detroit. There seems to be no letup in the inquiries for fabricated material and in view of the unsettled labor situation lettings must be considered to be quite satisfactory.

Structural Lettings Undisturbed

Boston, Mass., Sept. 29.—The usual amount of structural work in New England throughout the week has continued to be let in the face of the industrial disturbance. Boston strikes, including the policemen's walkout, together with other strikes in New England have had the effect of cutting the construction down for some time, and thus the steel strike loses some of its effect. Plans for the Broadway theater and post office have been changed to permit the use of stock shapes. The new plans will require 275 tons of steel and the work has been let. The Boston & Maine bridge at Haverhill, Mass., requiring 1799 tons of steel has been awarded. The average amount of work ahead among New England fabricators is nearly one and one-half months and this has the effect of increasing competition and of lowering prices.

Sentiment Has Improved

New York, Sept. 29.—While the strike still is exerting a depressing influence upon the eastern structural market, sentiment is greatly improved. The failure of the unions to effect a serious rupture in operations in eastern Pennsylvania generally is regarded as indicative that the force of the strike throughout the industry is on the wane. With few exceptions, new structural inquiries are small relatively. Nevertheless, they represent a good tonnage in the aggregate. The largest individual job to appear involves 3300 tons for a building for the Fulton Street Refrigerating Co., New York City. Other lots in the east, for the most part, run around 200 to 350 tons. Awards are small individually. Fabricated work is ranging from $100 to $125 erected in the district.

Active in Cleveland District

Cleveland, Sept. 30.—The strike in the iron and steel industry has not affected the structural market in this district, and some fairly good tonnages have been placed. A report is current that union workmen in the fabricating shops are opposed to working up material made in the mills since Sept. 22, the date of the beginning of the steel strike, but no verification is obtainable. Fabricators believe that if any men went out on such grounds it would be a mere subterfuge as they claim there would be no way of determining the date of the manufacture of the material. A great deal of new work is developing in the Detroit district. The Ford Motor Co. placed an order for a good tonnage with the American Bridge Co., for a power plant at River Rouge, and both the Ford interests and the General Motors Co., are understood to be closing deals with the same company in connection with further development work.

Lettings More Numerous

Philadelphia, Sept. 30.—Structural conditions in this district are improving. Fabricators report a number of new orders the largest of which are 600 tons for a Rittenhouse apartment house, this city, and 800 tons for the extensions of the plant of the American Locomotive Co., at Chester, Pa. Numerous small jobs also have been let. The plain shape market reflects awaiting situation and eastern mills report that new demand is somewhat inactive. Included in recent orders are several hundred lots for England, China and other countries.

Construction is Active

Chicago, Sept. 30.—Made up entirely of moderate lots, a fairly large tonnage of structural shapes was contracted during the past week in Chicago territory. The largest tonnage is 617 tons for an engine plant at Springfield, Ill., for Montgomery Ward & Co. Other tonnages are considerably less.

CONTRACTS AWARDED

Hotel, Lima, O., 300 tons; to Bellefontaine Bridge & Steel Co.

Building for Fisher Body Co., Detroit, Mich., 125 tons; to Daigle Iron Works.

Building for Foote-Burte Co., Cleveland, 900 tons; to McClintic-Marshall Co.

Building for Goodyear Tire & Rubber Co., Akron, O., 2600 tons; to Massillon Bridge Co.

Additional construction of beater, machine and finishing rooms for Escanaba Paper Co., Escanaba, Mich., 125 tons to Worden-Allen Co.

Factory for Interstate Milk Products Co. at Sparta, Wis., 100 tons to Worden-Allen Co., Milwaukee.

Addition to malleable foundries of Chain Belt Co., Milwaukee, 500 tons to Milwaukee Structural Steel Co.

Extension to the plant of the Standard Tank Car Co., Sharon, Pa., 175 tons to the McClintic-Marshall Co.

Extension to the plant of the National Metal Molding Co., Economy, Pa., 150 tons to the Jones & Laughlin Steel Co.

Group of foundry buildings for the Ford Motor Co., River Rouge plant near Detroit, 20,000 tons to the American Bridge Co.

Shop buildings at Springfield, Ill., for Montgomery Ward & Co., 617 tons, to the Morava Construction Co.

Foundry building at Milwaukee, for Chain Belt Co., 572 tons to Milwaukee Bridge Co.

Foundation material for building for the Tribune Co., Chicago, 317 tons, to the American Bridge Co.

Alterations and additions to foundry building for the Ohio Steel Foundry Co., Lima, O., 315 tons, to the Toledo Bridge & Crane Co.

Addition to power plant for the Monsanto Chemical Works, East St. Louis, Ill., 190 tons, to American Bridge Co.

Power plant at Muskegon, Mich., for Brunswick-Balke-Collender Co., 270 tons, to Hansell-Elcock Co.

Theater building for William Hamm, St. Paul, 300 tons, to the American Bridge Co.

Two 180-foot riveted spans at Hoquiam, Wash., 130 tons, to independent shop.

New factory and power plant for Edmonds Shoe Co., Milwaukee, 300 tons to Worden-Allen Co.

Addition to pipe storage for Steel & Tube Co. of America, Mark works, Indiana Harbor, 150 tons to Worden-Allen Co.

New hotel for Chippewa Falls (Wis.) Hotel Co., 250 tons to Worden-Allen Co.

Laboratory for Newport Chemical Co., Carrollville, Wis., 200 tons to Worden-Allen Co.

Theater building, Richmond, Va., 235 tons, to independent shop.

Building for Brown Cork & Seal Co., Baltimore, 200 tons, to independent shop.

Addition to Bridgeport Brass Co., Bridgeport, Conn., to Levering & Garrigues.

Bridge for Merril Coal Mines Co., Henlawson, W. Va., 350 tons, to the American Bridge Co.

Extension of the plant of the American Can Co., Portland, Me., 170 tons, to New England Structural Co.

Bridge for Boston & Maine railroad at Haverhill, Mass., 1799 tons, to Bethlehem Steel Co.

Rittenhouse apartment house, Philadelphia, 600 tons to the Phoenix Bridge Co.

Addition to new armory, Philadelphia, 100 tons to the Phoenix Bridge Co.

Paper mill, York Haven, Pa., 100 tons to Phoenix Bridge Co.

Machine shop and foundry for the American Locomotive Co., Chester, Pa., 800 tons to Belmont Iron Works.

Machine shop for Newton Machine Tool Co., Philadelphia, 200 tons to the Belmont Iron Works.

Addition to the plant of the National Sponge Silk Co., New Bedford, Mass., requirements increased to 300 tons and contract placed.

Extension to the plant of the International Motor Co., Allentown, Pa., 1100 tons, reported to have gone to the Phoenix Bridge Co.

CONTRACTS PENDING

Mercantile building, Baltimore, 250 tons, bids being asked.

Addition to Rhode Island hospital, Providence, 200 tons, bids being asked.

Addition to plant of Aluminum Co. of America, Edgewater, N. J., 200 tons, pending.

Building for Oxford Paper Co., Rumford, Me., 200 tons, bids pending.

Dupont office building, Wilmington, Del., 1200 tons, bids pending.

Building for Troy Blanket Mills, Troy, N. H., 350 tons, bids being asked.

Building for Fulton Street Refrigerating Co., New York City, 3300 tons, bids being asked.

Building for West Virginia Metal Co., Fairmont, W. Va., 1000 tons, bids pending.

Power plant for state of New York, Marcy, N. Y., 350 tons, bids pending.

Additions to plant of A. O. Smith Corp., Milwaukee, 1500 to 2000 tons. Plans being prepared.

Plant for Omaha Cold Storage Co., Omaha, Nebr., 400 tons, bids asked.

Scottish Rite Temple, Bloomington, Ill., 300 tons, bids asked.

Bascule bridge, Main street, Kenosha, Wis., 600 tons, bids in.

Motion picture theater for Lubliner & Trints, Chicago, 600 tons, bids asked.

Good Output

Continues in Sheets Except in Valley —Buyers Back Mills

Pittsburgh, Sept. 30.—Operations of the sheet mills, at no time as seriously hampered as some other kinds of fin-

ishing mills since the inception of the strike, are on a higher scale today than they were a week ago. At least a dozen of the independent plants are operating full while all of the isolated sheet mills of the American Sheet & Tin Plate Co. are running 100 per cent and marked improvement is noted at several of the plants which were crippled by the walk-out of Sept. 22. The Dover works, Canal Dover, O., the Guernsey works, Cambridge, O., the New Philadelphia works, New Philadelphia, O., the old Meadows works and Scottdale works, Scottdale, Pa., and the Wellsville works at Wellsville, O., all are running 100 per cent, while the return of the men at the Vandergrift plant, Vandergrift, Pa., and at the Mercer works, Farrell, Pa., has been sufficient to bring operations of these plants well up. Illustrative of the exaggerated estimates of a number of men out at some of the American Sheet & Tin Plate plants, it can be stated that while the organizers estimate the number of men on strike at Vandergrift at 4000, the maximum number of men ever employed there was 3000, and the organizers also claim to have 2000 men out at Leechburg where the maximum number employed has never been over 600.

Valley Production Stops

Youngstown, O., Sept. 20.—Every mill in this territory is idle. Some sheetmakers clamped on the lid last Monday as regards new business. District sales managers have been notified to defer taking orders until further notice. Certain sheetmakers here are accepting firm business only, the shipping date depending on the settlement of present conditions. Jobbers and dealers report considerable spot business in hand.

Eastern Mills Are Dull

Philadelphia, Sept. 30.—Sheet situation is strong in the East and particularly so since the strike has cut down shipments from the West. The leading eastern maker of blue annealed is sold up on practically all sizes for remainder of the year. A small Delaware maker is selling black and galvanized sheets at premiums.

Pipe Shortage

Seems Probable as Various Plants Are Idle—Cast Prices Higher

Pittsburgh, Sept. 30.—A serious shortage of tubular goods is probable over the remainder of the year in view of the fact that most of the independent companies in this and the valley districts are down as a result of the strike. Spang-Chalfant & Co., Pittsburgh, have been obliged to suspend temporarily because a strike of a few of its men made operation impossible, while the pipe mills of the Wheeling Steel & Iron Co., and La Belle Iron Works, are idle, and the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co., at Youngstown, have not yet resumed. The National Tube Co. meanwhile continues to keep most of its plants going practically full.

Scrap Market Drifting

Complete Absence of Buying by Mills Produces Lifeless Situation—Deliveries Held Up—Rerolling Material in Demand

FOR COMPLETE SCRAP PRICES SEE PAGE 950

Chicago, Sept. 30.—Although cessation of operation to considerable extent by steel mills has stopped shipments of those grades of scrap used in the open hearth furnace, it has stimulated to some extent demand for rolling mill grades and for rerolling rails, as plants producing bar iron and hard steel bars have not been affected. On the contrary, extra demand for these products has increased the operations of these mills and scrap is in demand. Foundries are also taking all the cast scrap it is possible to obtain because of interference with pig iron deliveries by the strike. Railroads are offering only fair tonnages, the Rock Island taking figures on 2250 tons, the Chicago, Milwaukee & St. Paul on 1000 tons and the Monon on 387 tons.

Boston Market Quiet

Boston, Sept. 27.—The market for scrap used by steelmakers is quiet. Dealers are not purchasing heavy melting, even at the low prices offered. Some scrap is still moving to blast furnaces on orders previously placed, but some orders have been canceled. Demand for No. 1 machinery is strong, although the price has dropped from the high point of a week ago. A Massachusetts foundry bought 200 tons at $29, delivered, and dealers are paying as high as $26, Boston yards.

Market Tone Firmer

New York, Sept. 29.—With early reports indicating failure of the strike at Bethlehem, Pa., the tone of the local scrap market is becoming firmer. Trading, however, remains of rather small proportions. Borings and turnings and cast scrap, although moving slowly, appear to be in best demand, and prices are slightly higher. Mixed borings and turnings are now being quoted at $10.50 to $11, f.o.b. New York, and clean cast borings at $12 to $12.50. No. 1 heavy cast and No. 1 machinery cast are also higher, holding at $21.50 to $22 and $22.50 to $23, respectively.

Foundry Scrap in Better Demand

Philadelphia, Sept. 30.—Demand for all grades of scrap is improving right along. A slight demand for railroad wrought has been coming from various rolling mills lately. Borings are also being called for. In heavy melting and allied grades little business is before dealers. Due to the strike situation the mills are postponing buying and dealers, in view of the lack of assurance that shipments can be made, are not anxious to have the stock leave their yards.

Prices Merely Nominal

Pittsburgh, Sept. 30.—Conditions in the scrap market here are much as they were a week ago, with steel manufacturers generally asking suspensions of shipments against contracts and doing no buying. Meanwhile shippers are not pressing material for sale, realizing the futility of trying to do business under present conditions. Foundry grades of scrap also are moving slowly although the effect of the strike on the foundries generally has been slight. Prices are nominal in the lack of important transactions. The Pennsylvania railroad October list of scrap involves offerings of 17,722 gross tons.

No Buying at Buffalo

Buffalo, Sept. 30.—With no mills in the market for scrap in this territory, conditions in this trade are very quiet. Only a few mills are operating and these apparently have sufficient stocks to take them along for a while without doing any purchasing. Scrap traders are not active and are resigned to the awaiting of the return of the steel trade to normal. Prices continue firm.

Trading Completely Absent

Cleveland, Sept. 30.—Scrap iron and steel is on the dead-center here. There is no trading even among dealers. Mills, of course, have completely cut off shipments because of the strike. Dealers' yards are crammed full, and while some bargains could be picked up at the plants of producers anxious to sell scrap to get the space, they are finding no outlet. Dealers claim not in years to have experienced such a dullness as prevailed in the past week. The market sentimentally is much weaker, but prices remain unchanged because of the total absence of trading.

Only Foundry is Active

Cincinnati, Sept. 30.—With the exception of a little activity in foundry scrap the market is lifeless. Shipments to the Pittsburgh district are being suspended, although it is predicted that the situation may clear up in a few days when a resumption of deliveries to consumers in that territory will be resumed. Heavy melting steel is very weak. Foundry cupola-size scrap is holding its own.

Consumers Holding Off

St. Louis, Sept. 27.—Trading in the scrap market is virtually at a standstill. The trend of prices on nearly all grades is sharply lower and the feeling is bearish, especially among small dealers and yard interests. The sharpest cuts have been made in miscellaneous railroad and country scrap. There is no buying by consumers, except in small lots for immediate use, and speculative activity has stopped. Mills and foundries in this district have not been affected directly by the strike, but uncertainty in the entire industry has influenced buyers, and they are disposed to await developments. Offerings from all sources are limited.

Buyers Aiding Bar Mills

Refrain From Bringing Pressure For Deliveries—Much Tonnage Being Offered Operating Plants—Bar Iron Improves

Chicago, Sept. 30.—Consumers of steel bars are standing behind the strike-bound mills and seem to realize that the present battle is being fought for the good of industry in general, expressing a willingness to undergo whatever inconvenience may result from lack of material in order to assist in settling the dispute correctly and once for all. Much voluntary encouragement is being expressed to the producers and no pressure is being brought to bear on the mills to bring about greater production by a surrender to labor demands. Most producers are refusing to book new business and are accepting specifications on existing contracts subject to such delay as may result from the present strike.

Demand for bar iron is greatly increased by the difficulties of obtaining soft steel bars, and mills producing this material have jumped at once into a position of heavy business after having been unusually slack for several months. Demand is coming from all sorts of users and the mill situation is decidedly in contrast to that of preceding weeks. In spite of the heavy demand, prices remain unchanged at 2.62c, Chicago mill.

Much the same condition is found in demand for hard steel bars. Many consumers are seeking to obtain tonnages of this material to replace soft steel bars held up by the strike. Consumers with contracts already on mill books are specifying freely and sufficient business for the remainder of the year is now in hand. With a scarcity of rerolling rails, the situation is decidedly strong from the viewpoint of producers. The quotation continues firm at 2.55c, Chicago mill.

Take Orders at Premiums

Philadelphia, Sept. 30.—Very few western makers in taking steel bar orders, except as specifications on contracts. One Pittsburgh interest is taking occasional small bar orders to be rolled on high cost mills at 2.50c to 3.00c Pittsburgh. An eastern Pennsylvania maker is taking some bar orders but mostly to be made of special steel at base price of 2.50c Pittsburgh. Some reinforcing bars are being placed but not in large volume.

Active Mills Are Deluged

Cleveland, Sept. 30.—Those makers of bars and other finished products who are generally known to be operating at a favorable rate are being deluged with specifications and requests for new tonnage. The Cleveland offices of some of these companies report the inquiry received the past week to have been the heaviest in their history. Because of the extensive demand, only a small portion of the offered tonnage is being accepted. This was the case of an attractive lot of 5000 tons of bars. Leading Pittsburgh mills are taking some new business subject to indefinite delivery. On a round lot of bars, Chicago mills offered to deliver partly in October and November.

Taking no New Orders

Pittsburgh, Sept. 30.—Makers of merchant steel bars here whose plants are down naturally are refusing to honor new inquiries or specifications and those whose works still are in operation are pursuing a like course in the matter of new orders as their contract obligations, especially in the smaller sizes will probably absorb all production this year. Manufacturers who have not suffered from the strike are flooded with inquiries from buyers whose regular sources temporarily are cut off and if the tonnage was available no doubt could get substantial premiums.

Little Interruption to Operations

Pittsburgh, Sept. 30.—Aside from some interruption in the supply of bars and rods, makers of nuts, bolts and rivets generally are unaffected by the steel strike and shipments are going forward in practically normal fashion with prices showing no change.

Business Does Not Suffer Much

Pittsburgh, Sept. 30.—The principal producers in this district of cold finished steel bars and shafting note practically no interruption to business as a result of the strike and while some of them are not getting full supplies of merchant steel bars, the fact that they all had fair sized stocks on hand before the labor disturbance again enabled them to keep up plant operations to the recent rate. While demands are coming from fairly widely scattered sources, the best call comes from the makers of automobiles and tractors. Prices are unchanged at 3.60c, base Pittsburgh, and deliveries fairly good.

Have Reserve Stocks

Pittsburgh, Sept. 30.—While the plants of some makers here of hoops, bands and cotton ties are down as a result of the strike, enough capacity is active to meet current specifications. Deliveries also are helped by the fact that most makers have fair sized reserve stocks of hoops and cotton ties.

Plates Firm Up to 2.65c

Shading Disappears as Production is Restricted—Eastern Mills Book Increased Tonnage and Run Better

Philadelphia, Sept. 30.—Eastern platemakers say the closing down of western mills is causing them to receive much business which otherwise would not come their way. Brisk buying is reported in all directions and numerous tonnages have been booked from 1000 to 3000 tons for bridge work, tanks and particularly for oil well boilers. One mill has given an option on 30,000 tons for 10 vessels. The Emergency Fleet corporation has specified for moderate tonnages during the week. The Lukens Steel Co. will put its 204-inch mill in operation tomorrow making all its mills active. This company reports business greatly improved and only the fact that all strikers are not back has prevented it from running 100 per cent in the past week. The market is stronger and shading is less frequent.

Price Stiffens Sharply

Pittsburgh, Sept. 30.—The effect of the strike in plates has been to bring about a demand upon the manufacturers whose mills are active, from consumers whose sources of supply are shut off and a considerable amount of business has been placed in this district in the past few days at the full March 21 base of 2.65c. Among the sales was one involving close to 2500 tons. Just before the outbreak of the strike the market was pretty generally quoted at 2.50c, Pittsburgh, for minimum lots of 1000 tons and it was said that that price also was being accepted on smaller tonnages. The demand continues almost entirely from the tankmakers, although some foreign inquiries for ship plates also are noted.

Small Orders

For Railroad Cars More Numerous—Export Lots Are Placed

Chicago, Sept. 30.—Occasional inquiries for railroad cars are being received, all being for small lots and some offering much business for builders. The former inquiry by Mitsui & Co., exporters to Japan, for 250 sets of freight car trucks, has been revived and increased to 500 sets. This will require about 10,500 tons of plates, shapes and bars and about 2000 axles, which will involve 500 tons additional of steel. The Cuban railway is inquiring for six sleeping cars, and the Atlantic Coast line for four diners. The latter is also in the market for 100 phosphate cars, the inquiry for which was made some months ago and allowed to lapse. The American Car & Foundry Co. has taken an order for 25 mine cars for the Forks Coal Co., Portage, Pa., 200 mine cars for the Pennsylvania Coal Co. of New York, and 300 tank cars for the Crown Oil & Refining Co. The Standard Steel Car Co. has taken an order for 200 flat cars for the Cuban Central railroad, and the Pressed Steel Car Co. for 200 box cars for the same company.

Export Record is Broken

September Banner Month of Year for Sales — Strike Checks Delivery of Seasonable Goods—Agents Holding Up New Inquiries

NEW YORK, Sept. 29.—Strike conditions have begun to show an effect in the export trade. The volume of inquiries is adequate to give to the American industry all the foreign business desired, but the problem of delivery is causing so much anxiety that agencies are hesitating about making quotations. All export inquiries were held up during the first part of last week in the hope that a better report from the mills would warrant the opening of negotiations. As the strike continues, however, the agents are beginning to advise their foreign customers that this is not the time to enter into new contracts. All of the agents are attempting to supply essentials to foreign customers. So far the question of price has not entered into the matter.

Despite the strike, however, the foreign sales made during September promise to exceed greatly the sales made during August and will create a new record for the year. If strike conditions continue to improve, there promises to be a rush of export business to the mills. The inquiries now in hand are adequate enough to give the mills more business than they could turn out. The labor trouble in the United States, so far as foreign trade is concerned, comes at a most opportune time, as England's rail traffic is tied up and British producers are finding it extremely difficult to fill their commitments.

German salesmen have made their appearance in South America. So far as could be learned the Germans are not as yet offering to sell iron and steel products, but the methods they are using to obtain orders for other products are such as will have a bearing on the situation in the future. It is said that the Germans are offering to sell upon a basis of delivery as soon as possible at a price subject to adjustment with discounts. The terms offered by the Germans would be at a price approximating 20 per cent below the market at the time of actual delivery.

The Consolidated Steel Corp. continues its effort to arrange with its constituent mills to increase its proportion of output for export. The Consolidated mills set aside 10 per cent of their output for foreign sales. In some products agreements are being signed to allocate as much as 20 per cent of the output for export. The increases are being made in sheets, bars and tin plate. This applies only to the 1920 business.

Actual sales made during the past week contain nothing of outstanding importance, although a number of contracts were mentioned by export houses as indicative of the nature of the business. Denmark, for instance, has purchased 1500 tons of rods, and a new inquiry for 1000 tons of rods has been received from Norway. England is inquiring for bars and sheets and a number of sales have recently been made.

Little business is done with France and inquiries are for small tonnages. One of the recent sales noted was 200 tons of plow shapes. An inquiry was received for five tons of billets. Belgium has inquired for 10,000 tons of pig iron, but it is believed that American makers will not be able to meet the price which either the French or the English furnaces will be able to quote.

Italy has purchased some machinery and a few hundred tons of pig iron. Greece is buying bars and wire. Holland has been buying actively of ship material in lots varying from 500 to 1000 tons. The Dutch have also been purchasing nails, but it is understood that these goods are intended for their East Indian colonies. Australia is purchasing wire, sheets and bars.

The Orient continues to be a good market for American iron and steel. One house reported the sale of 3000 tons of light rails to Japan.

American agents are trying to hold trade in South America. This and the Oriental markets are considered permanent acquisitions for our industry and an effort is being made to keep these customers supplied even during the strike in this country. Recent sales to South America represent an accumulation of inquiries. A large tonnage of sheets have been sold there in quantities varying from 30 to 300 tons.

Foreigners have been asking for large tonnage of American coal and coke but it has been impossible to ship. The steamship lines prefer to engage their tonnage in carrying commodities which pay higher rates and in response to foreign appeals the shipping board has refused to divert government vessels to this trade because, it is argued, the foreign nationals should so engage their own ships.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead, New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Sept. 24	23.50	53.00	6.25	7.00	33.00	8.50	41.00
Sept. 25	23.50	53.50	6.25	7.00	33.00	8.50	41.00
Sept. 26	23.50	53.50	6.25	7.00	33.00	8.50	41.00
Sept. 29	23.50	53.00	6.25	7.00	33.00	8.50	41.00
Sept. 30	23.50	53.00	6.25	7.00	33.00	8.50	41.00

* September shipment from Singapore, f.o.b. New York.
† American Smelting & Refining Co.'s price.
‡ Producer's price. Outside market, Sept. 24, 25, 26, 29 and 30, 21.75c; lake, 22.00c to 22.25c; casting, 21.00c to 21.25c.

NEW YORK, Sept. 30.—The steel strike, the English railroad strike and the violent fluctuations in the foreign exchange markets have been the dominating factors in the nonferrous metal markets, making for great uncertainty among both buyers and sellers, with consequent little business. Prices held their own but did not advance during the week.

The English railroad strike did not begin until Sept. 28 and so the trade has not yet had much opportunity to judge its effects on our markets, excepting the general effect on the tin situation. With British shipping tied up, shipments of tin will cease for the time, which, if prolonged, may affect spot tin here. The British tin market dropped over £3 the first business day after the strike was called, but reacted today. The Sterling exchange market, after a good gain based on reported arrangements whereby Great Britain will not be compelled to pay its interest annually, dropped sharply in conjunction with the strike.

Copper has showed little change, large producers maintaining their quotation of 23.50c for early shipment. Outside sellers early in the steel strike dropped their prices to 21.50c, but later were more confident, substantial sales being made last week at 21.75c, at which level the market has stood for several days. The market for casting copper has stood at about 21.00c and lake at 22.00c to 22.25c.

The steel strike has caused consumers of tin to hold back from purchasing this metal, but prices have held fairly well. The market has been strong at Singapore, while the rise in exchange added to the cost of importing tin. Quotations on Straits tin this week have averaged around 53.00c for September and October shipment from Singapore; 52.75c for November and December shipment. Spot Straits tin is quoted about 55.25c to 55.50c; spot electrolytic tin 54.75c to 55.00c; spot 99 per cent tin, 54.25c.

Several hundred tons of lead recently sold for September shipment at 6.27½c, New York; a later sale consisted of 500 tons for November shipment at 6.25c, New York.

Strikers Steadily Losing Ground

Increasing Number of Men Returning to Mills, While Leaders Fail in Attempts to Close Plants of Bethlehem Steel Co., and Jones & Laughlin Steel Co.,— Judge Gary Testifies Before Senate Committee

THE second week of the strike in the iron and steel industry shows definite improvement in the situation from the standpoint of the employers. In some districts the mill operations have been increased appreciably, with the Pittsburgh district standing forth most prominently in this respect, but the most significant feature of importance to the industry as a whole is a tendency on the part of many men in all districts to return to their jobs. With some important works the number of men on duty increased 20 to 25 per cent in the week. Organizers for the unions are finding it increasingly difficult to hold their men in line, and as time goes on the indications are they will find it impossible, as the majority of the employes are in favor of working. A deadlock may exist for a time, but employers express confidence that eventually the sane judgment of the men must assert itself.

In the Chicago district a sufficient number of men have returned to permit a slight increase in operations. In the southern, eastern and Massachusetts districts strike leaders have failed utterly in their attempts to create dissension. In the Cleveland district men have returned to work in one plant and partial operations resumed, otherwise production in that territory is completely suspended. In the Youngstown district hundreds have asked their employers to resume operations, and the number is now believed sufficient to warrant resumption, although this has not actually been undertaken. The district has been calm because the strikers have been allowed to have their own way, and it is feared that an attempt at operation may cause disturbances. In the Pittsburgh district the mills are making steady progress toward a return to normal.

Repeated attempts to interrupt the operations at the plants of the Jones & Laughlin Steel Co. have failed, while the supreme effort of the unions to close the plants of the Bethlehem Steel Co. resulted in a fizzle. In every district the tactical advantage appears with the employers.

Interest centers in the testimony of E. H. Gary, chairman of the United States Steel Corp., who appeared before the senate investigation committee, Wednesday. Having failed to score a point before the senate committee, strike leaders are now hoping to make their fight the dominant issue before the industrial conference in Washington, Oct. 6.

The Allegheny county court has upheld the mayor of Duquesne, Pa., in fining William Z. Foster and an organizer $100 each for violating the mayor's order against speaking in public. The court held that Foster and his workers have no right to make incendiary speeches.

Strike Fails in Pittsburgh District

PITTSBURGH, Sept. 30.—Just as the Belgian army five years ago held the German invading army in check long enough for the allied countries to gather their forces, so the Pittsburgh steel manufacturers have stemmed the tide of the discontented workmen in their plants and have spared not only the steel industry but all other industries from a condition where the hiring of workmen would be possible only through the offices of the labor union.

As far as the Pittsburgh district is concerned the strike has been a failure and while labor organizers are not yet ready to admit this, they can point to only a few plants either of the United States Steel Corp. or the independents, that are down as a result of the strike, while a number of them which suspended or curtailed during the first day or two of the trouble, have had sufficient men return to permit a resumption. Intimidation of workmen has been freely practiced by strikers, and this is preventing full operations.

The strikers shot their bolt on the first few days of the strike and the past four or five days have seen a steady decline in their fortunes. They have not been able to maintain their gains either at the plants of the Carnegie Steel Co., or at those in the lower Monongahela valley. Although the Pittsburgh works of the Jones & Laughlin Steel Co. were to have been shut down, according to the labor leaders, these works are running practically full, with only a slight defection even among foreign laborers. Failure to cripple either the corporation or the largest independent in the Pittsburgh district has been a body blow to the agitators.

The strike has taken several peculiar twists. While aimed directly at the Steel corporation it has affected the independents throughout the country to a greater extent. One of the important features of the situation is the fact that steel companies which have been operating under agreement with the Amalgamated Association of Iron, Steel and Tin Workers have been affected as much as those who had not signed the scale, despite the claims of the national officers that the charters of the delinquent lodges are being revoked and contracts will be faithfully carried out. The situation applies to the cases of the Lake Erie Nut & Iron Co., Cleveland; the A. M. Byers Co., Girard, O., the Trumbull

Steel Co., Warren, the Deforest plant of the Republic Iron & Steel Co., Niles, O., and others. The question is asked: Of what value is a contract with the Amalgamated association when it cannot keep its men at work under present conditions?

The Carnegie Steel Co. issued the following statement today:

"We are making steel and lots of it and that tells the story. We have lost no ground, but on the contrary we still are gaining."

The plant of the Weirton Steel Co., at Weirton, W. Va., has been shut down. The plant was the only one in the Steubenville district which continued in operation last week. Strikers planned to march across the Steubenville bridge in a body, but Governor Cornwell, of West Virginia, wired Governor Cox, of Ohio, stating that this would be considered an invasion of the state. Governor Cox ordered sheriffs to prevent the strikers from carrying out their threat, and in the meantime the plant was closed.

An indication of how steel manufacturers regard the strike is the placing of an order for 30 rolls by one of the Steel corporation's subsidiaries. This order, which has been held up for the past week or 10 days, it is said, would not have been placed now if there was any doubt about the outcome of the strike.

BUFFALO

Situation is Improving; More Men Return

Buffalo, Sept. 30.—The strike situation in the Buffalo district has taken a turn for the better. Between 500 and 600 men returned to work Monday at the plant of the Lackawanna Steel Co., Lackawanna, N. Y., and 100 more came back Tuesday. They went to work through lines of pickets who failed to dissuade them. Neither the furnaces nor mills have been put in operation, but officials expect increasing numbers will report at each new shift.

"We are ready to take the men back as soon as they want to return," said George F. Downs, vice president.

No attempts were made to operate the plants of the Donner Steel Co. or Rogers, Brown Iron Co. It was announced by the latter that work will be suspended until a full working force is available.

Attempts to force a strike of men employed at the Buffalo Union furnaces, the Wickwire Steel Co., and the Tonawanda furnaces of the Donner Steel Co. apparently have failed, for these plants, as well as all finished material mills, are working smoothly. The return of workers at the Lackawanna plant now brings the number of men still out in this district down to a figure slightly less than 10,000.

Bars the Agitators

BUSINESS men and citizens of West Middlesex, Pa., have been taking a vigorous interest in the present strike. "Strike agitators keep out" in effect has been adopted as the town slogan. A few nights ago a truckload of organizers and strikers from Sharon attempted to enter the town. The progress of the truck was blocked by a roped barrier stretched across the main street and upon being surrounded by a determined committee of the citizens, the occupants were forced to turn about and retrace their course, despite their loud protestations. Volunteers from among the townspeople nightly have been patrolling the two blast furnace plants of the vicinity. A delegation of the citizens early last week called upon the officials of the United Iron & Steel Co. and offered to "pitch in" and perform manual labor at the plant if the workmen struck. They presented a similar offer from the farmers of surrounding country. "We won't let foreigners close this plant," they said.

This is the reason why both the Fannie and the Ella furnaces at West Middlesex are in operation.

PHILADELPHIA

Bethlehem Busy Despite Attempt at Strike

Philadelphia, Sept. 30.—Sentiment in regard to the strike situation has improved greatly among eastern steelmakers due to recent developments, of which the most important was the failure of the Bethlehem Steel Co.'s employes to strike. The situation has not changed in any way, since the strikers number only a few hundred and include mostly machinists. It is considered assured that no more Bethlehem employes will go out at Coatesville. The mills in this district are operating practically the same as last week. Out of 1700 who obeyed the strike call only 900 are still out. The mills are being operated as full as orders will permit. At the plant of the Milton Iron Co., Milton, Pa., 200 men who struck a week ago returned to work in the east end puddling mills Monday.

The Bethlehem Steel Co. today issued the following statement:

"It was ascertained that reports had been received at the offices of the Bethlehem Steel Co., from their plants located at Sparrows Point, Steelton, Lebanon, Reading and Bethlehem. All of them substantially reported full operations. Exceptions to this were only in unimportant, isolated units, in no way affecting the larger and important operations. There is nothing to indicate that there will be any curtailment in production."

BOSTON

Steel Works Operating at Full Capacity

Boston, Sept. 29.—All steel works at Worcester, New Haven and Bridgeport are operating at capacity and report normal labor conditions. The Fore River and Squantum plants of the Bethlehem Steel Co. are operating at full capacity and report no intimation of labor trouble. The embargo on shipment of freight to steel mill centers which has just been announced will affect many New England plants. Practically all of the pig iron producers in the Buffalo district have notified the trade that deliveries will be held up indefinitely, and therefore they can enter no more orders at present.

Foundries in New England do not believe that steel strike will affect their supply of pig iron.

CLEVELAND

Situation is Unchanged; Ore Moving Slowly

Cleveland, Sept. 30.—Iron and steel production in the Cleveland district has been practically at a standstill since the third day of the strike and although the ranks of the strikers show evidence of weakening, active production is not expected to be resumed until the situation has cleared. Employers have made no effort to run their plants, but have let it be known they are ready to resume as soon as the men report. At present only one of the 20 plants in the district is working, and that is working at one-third of its capacity. Operation of blast furnaces came to an end last Wednesday when the fires at the two plants of the Otis Steel Co. were banked. The plant of the Empire Rolling Mill Co. also closed during the week, as well as the mill de-

partments of the Otis Steel Co. which had been kept going.

Officials of the American Steel & Wire Co. announced on Monday that they were operating the H-P nail works on a limited basis. They stated that about one-third of the men who walked out reported for work when the plant opened Monday, and on Tuesday 238 men out of a total of 635 employes had reported. All were re-employed.

Men employed in a metalworking plant in Cleveland refused to work up steel which was produced since Sept. 22, when the strike was called. The shipment of the steel was accordingly suspended by the mill on request.

Shipments of ore have not been interfered with seriously, although the officials of the lake seamen's union have given out several statements that the men have voted to strike. A number of vessels have been laid up because of the lack of storage space for ore, and the Pittsburgh Steamship Co. is reported to have laid up its smaller barges. Twenty laborers on the storage dock at Randall failed to show up for work on Monday after a celebration. Loading coal on three docks was suspended by a strike of coal dock workers. Officials of the International Longshoremen's association claimed that all coal and ore handlers at Cleveland will be on strike within a few days.

At Buffalo, union officials announced that the strike of lake seamen is deferred until the cooks vote. The firemen, coal passers, water tenders and seamen have voted.

Despite strenuous efforts of agitators to organize the National Tube Co., Lorain, O., the plant is working at approximately normal capacity. Out of a total of more than 10,000 iron and steel employes, less than 200 men are on strike. At a recent meeting of the local switchmen's union, the men employed in transporting materials to and from the plant, voted by an overwhelming majority not to strike.

DULUTH
No Headway is Made by Strike Organizers

Duluth, Sept. 30.—Little headway, if any, has been made by organizers for the steel workers in this district. Since the calling of the strike Sept. 22, operations at the local plants of the Minnesota Steel Co. have continued on a normal basis. No men on the iron ore ranges have gone on strike, and little strike talk is heard in the entire district. The only defection reported is at the Zenith mine near Ely, Minn., where a number of foreign workmen walked out.

BIRMINGHAM
Strike in South Proves Complete Failure

Birmingham, Ala., Sept. 30.—With no one in authority in this district to call it off, the "strike" of the iron and steel workers continues, with all plants of the Tennessee Coal, Iron & Railroad Co. and American Steel & Wire Co. in operation. Production is normal. Many of the foreign-born laborers applying for reinstatement are being refused work because of their inefficiency. Operations of all mills start on time, and the workmen remaining loyal have been given to understand that there is plenty of work ahead for many months. The Birmingham Southern railroad suffered the loss of a few machinists, but the night crew at the steel mills cared for the engines, and the service was not interrupted. The strike in the Birmingham district throughout was a dismal failure. Less than 250 men are out.

CHICAGO
Gary and South Chicago Mills Operate

Chicago, Sept. 30.—Little change is shown in the strike situation, despite expectations that a large number of men would return to work or that part of those who have been working would join the strikers. The plant of the Inland Steel Co., continues entirely idle, except that fires are being kept up in two banked blast furnaces.

At the Gary plant of the Illinois Steel Co. four blast furnaces are active. Two units of the open hearth, comprising 28 furnaces, are producing steel. The duplex plant, the slab mill, plate mill and two merchant mills are in service, and the rail mill is working part time. At the South Chicago plant four blast furnaces are active. The slab mill and universal plate mill also are turning out their products.

At Gary, 280 coke ovens of the 700 in the plant are producing coke. At Joliet one unit of 70 coke ovens is active and the blast furnace stacks are banked, while mills are idle.

Among the smaller concerns affected by the strike no change has occurred. The situation continues quiet, with occasional sporadic cases of violence of no particular significance. No effort is being made to use strike-breakers and men at work in the mills are employes on the payrolls before the strike.

Striking steel workers at the Bay View plant of the Illinois Steel Co., Milwaukee, commenced returning to their jobs last Friday. R. B. Charlton, general manager of the plant, stated Sunday that many employes have already returned to work, giving promise that operations may be resumed during the present week. The plant normally employs between 1350 and 1500. One of two blast furnaces at the Bay View plant was in operation when the strike was called.

YOUNGSTOWN
All Mills Idle; No Attempt to Operate

Youngstown, O., Sept. 30.—Every iron and steel plant in the Mahoning valley of importance is tied up completely. All blast furnaces are banked and not a wheel is turning in any of the rolling mills. The Trumbull Steel Co., Warren, O., operated for 36 hours during the first part of last week but closed down every department of its works until further notice. The electricians employed by the Trumbull company and affiliated with the electrical workers' union made demands for 90 cents per hour and changes in working conditions.

In various parts of the valley reports are current that a large number of members of the Amalgamated Association of Iron, Steel & Tin Workers would return to work immediately if enough laborers and cranemen were obtainable to operate the sheet rolling departments. On several ocasions last week, committees of this association tried to induce mill owners to start up their plants.

Indications are that the officials of the Carnegie Steel Co. will try to operate the Ohio works probably this week. Monday morning several small groups of mechanics, carpenters and machinists entered the plant.

Practically all of the 60 hot mills of the plants of the American Sheet & Tinplate Co., at Newcastle, Pa., began work Monday. The plant of the Carnegie Steel Co., at Newcastle, improved its schedule.

A large number of men returned to work at the plants of the United States Steel Corp., at Sharon and Farrell, Pa., according to officials. The

plant of the American Sheet & Tinplate Co., at Sharon was scheduled to begin operations Tuesday. Two blast furnaces of the South works at Farrell are now in operation. The blooming and bar mills of this plant are declared to have practically full complements of men. Many men have returned to work at the Sharon plant of the Sharon Steel Hoop Co. The plant of the Valley Mould & Iron Co., Sharpsville, Pa., have resumed.

Ore, coke and coal movements in the Youngstown district are entirely suspended. It is estimated that 1344 cars of ore and 776 cars of coal have accumulated in this territory since an embargo was declared and the cars are subject to a demurrage charge of $2 for the first four days and $5 for every day thereafter. The regional directors will meet in Chicago this week and decide how the demurrage charges will be assessed.

Pickets are Enjoined by Judge Landis

Chicago, Sept. 29.—Judge Kenesaw M. Landis, in federal court, has issued an injunction forbidding strikers to picket the plant of the Pollak Steel Co., in South Chicago. The injunction forbids any picketing, intimidation or threats or any effort to prevent in any way the employes of the company returning to work or interfering with their right to work if they choose. A hearing on the injunction was to have been held Sept. 30. The company claims 99 per cent of its men desire to work, but are kept away by intimidation.

Steel Wages Far Above "Pauper Line"

Pittsburgh, Sept. 29.—In refutation of the testimony given before the Kenyon investigating committee in Washington last Thursday by John Fitzpatrick, chairman of the national committee for organizing iron and steel workers, that wages for steel plant laborers were below the "pauper line," a table of wages has been prepared, based on the reports of several companies, which not only shows wages for the workmen to be well above that line, but to be greatly in excess of those paid common labor in other industries.

Common labor commands from 45 to 50 cents an hour, the standard workday being eight hours and carrying time and a half for overtime. Thus the workman, who puts in 10 hours is paid for 11 hours and for a 10-hour day received from $4.95 to $5.50. Semiskilled laborers earn from $8.20 to $9 a day, these wages being earned principally in wire and tube mills, where a few weeks' training makes a workman semiskilled. Average daily wages of skilled labor run as follows:

Sheet rollers	$28.16
Sheet heaters	21.12
Roughers	11.92
Catchers	11.92
Steel pourers	12.84
Vessel men	14.65
Engineers, manipulators, etc.	12.63
Blooming mill heaters	17.92
Skelp mill heaters	18.18
Skelp mill rollers	21.73
Lapwelders	16.08
Bowers	13.76
Bottom makers	12.91
Regulators	13.52

Employe Speaks Out For American Workmen

Chicago, Sept. 27.—A. K. Perkins, an employe of the Inland Steel Co., at Indiana Harbor, Ind., has sent a telegram to Senator Kenyon, chairman of the senate committee on education and labor, in which he speaks for employes of the Inland Steel Co., in contradiction of the testimony of John Fitzpatrick.

The assertion is made that 90 per cent of Inland employes desire to return to work and that the company desires to operate; that the men had nothing to strike for, as an 8-hour day has been in effect, a profit-sharing system is being put into effect and a collective bargaining plan has just been started.

He states the lowest wage paid common labor is 50 cents per hour and that Inland employes are paid higher wages than the Amalgamated scale. Continuing:

"This strike was called against the Inland Steel Co.'s plant without any demands having been made upon the company. A large majority of the men attempted to go to work last Monday, but were restrained by the threats of a mob of about 3000 men, mostly outsiders. We consider this strike a crime against the men that toil, and we believe it is a blow at the vitals of our government."

Motor Car Industry May be Forced to Suspend

Detroit, Sept. 30.—Michigan's extensive automotive industry may be almost suspended if the strike in the steel and iron industry continues two or three weeks. A week's suspension of some of the plants supplying the industry with materials has resulted in curtailment of production in some of the factories.

Most of the motor car and truck plants here are operating with but a week's supply of materials. A few of them are on a day-to-day basis, depending on shipments from Pittsburgh and Cleveland.

Directors of the Michigan Manufacturers' association representing 1500 plants in the state, 500 of which are in Detroit, have indorsed the stand taken by the United States Steel Corp., and have pledged their full support in "the fight for industrial liberty."

Automotive workers are among the highest paid in the country and there has been no movement as yet reported of their joining forces with the steel workers, morally, financially or otherwise.

Structural Steel Society Commends Gary

Chicago, Sept. 27.—The Structural Steel society, with offices in Chicago, has sent the following telegram to E. H. Gary, chairman of the board of directors of the United States Steel Corp., approving his stand on the proposal to arbitrate the present situation:

"The Structural Steel society, representing 32 fabricating plants in the Middle West, assembled today in Chicago, rejoices in your statement of last night refusing to arbitrate the principle of the open shop. We are glad to have such a leader as you in our crisis. You are right, it is our fight as part of the public as much as it is yours. You have an obligation to the nation beyond your immediate obligation to the Steel corporation. The principle involved is one in which the nation is vitally interested, and as you state cannot be arbitrated or compromised. We pledge ourselves to go home and in our several communities enlist the co-operation of all civic organizations to stand back of you and support you on the principles enunciated in your statement of last night. If there is any definite thing we can do please tell us. We are with you to the finish."

Support Steel Industry in Stand for Open Shop

Both the Bridge Builders and Structural society and the Steel Fabricators of the United States have adopted resolutions supporting the employers in the steel industry in their determination to stand firm for the open shop. The former organization, at a meeting in New York Sept. 12, adopted the following resolution offered by C. Edwin Michael, president of the Virginia Bridge & Iron Co., and former member of the war labor board:

"RESOLVED: That the members of the Bridge Builders and Structural society believe the proposed disturbance unwarranted and unpatriotic, and express confidence in the policy and management of the steel industry to maintain the principles of the open shop, and cordial and mutually satisfactory working conditions with its employes."

Foundrymen Meet in Convention

Registration of 800 at American Foundrymens' Association Annual Meeting Includes Representatives From Foreign Countries—First Session Given to President's Address and Welcome From Local Foundrymen—Many Papers Presented

PHILADELPHIA, Sept. 30.—With a total registration of about 800, including more than a score of manufacturers and foundrymen from England, France, Norway, Japan, India and other countries, the twenty-fourth annual convention of the American Foundrymen's association formally opened Tuesday morning under circumstances which forecast a week of eventful and valuable meetings.

In the annual address of the president, A. O. Backert, Cleveland, compared the problems now confronting foundrymen with those encountered during the war. He stated that as production was the one essential to overwhelm the enemy, so increased production is needed today to restore the equilibrium of trade and industry. Referring to his extended trip throughout the United Kingdom and France, he declared that mechanical appliances are not in such widespread use in the casting industry of those countries as in the United States. However, many plants are modernly equipped and their practice is equal to the best prevailing in this country. Repetition in England and France is not nearly so prevalent as in the United States and lack of standardization retards the output in the European countries. In England the converter process is used more than the open hearth which is just the opposite of the practice in this country where open hearth tonnage exceeds converter almost ten to one. After enumerating the courtesies extended to him during his visit, Mr. Backert extended a warm welcome to the large number of visitors from overseas attending the convention. "By their journey overseas they are helping to build a friendship which forever should tie together the allies of the great war," he said. In conclusion the president acknowledged the valuable work of the secretary-treasurer, directors of the association and members of committees and paid touching tribute to the late Maj. Joseph T. Speer, who died Jan. 5, 1919.

Following his address Mr. Backert read a letter from Thomas Firth, past president of the British Foundrymen's association. Mr. Firth acknowledged the value of the work of the American foundrymen including W. J. Keep, Richard Moldenke and Thomas West. He declared that increased production is the only solution for the present industrial problems.

In welcoming foundrymen to Philadelphia Thomas Devlin, who has been actively engaged in the foundry business continuously for 65 years, declared opportunities for success in the industry are far greater today than ever before. He recounted the early days of the Philadelphia and American Foundrymen's association. John A. Penton paid a tribute to Mr. Devlin's active interest in problems of the industry and referred to him as the premier foundryman of the world.

Edward J. Cattell, statistician of the city of Philadelphia, interestingly reviewed the achievements of that city in industry and science. Referring to the present labor situation, he spoke in an optimistic vein, stating that not more than 3 per cent of the workers of the country are touched by foreign heresy. J. P. Pero, past president of the association spoke on the growing importance of the literature contributed to the foundry industry through the technical papers of the association.

The nominating committee named by president is as follows: B. D. Fuller, Niagara Falls; R. A. Bull, Coraopolis, Pa.; J. P. Pero, East St. Louis, Ill.; A. E. Howell, Nashville, Tenn.; Stanley G. Flagg III, Philadelphia.

Following the address of the past president, Russell R. Clarke, Eagle Brass Foundry, Seattle, read a paper entitled "Considerations Affecting Brass Melting in Gray Iron Shops." The author presents in a simple manner a few of the considerations that should govern the occasional production of nonferrous castings in a gray iron shop. The importance of correct melting practice is emphasized, it being stated that molders make their own scrap; furnaces can make everybody's. In a paper by F. J. Ryan, American Metallurgical Corp., Philadelphia, it is pointed out that brass melting presents two vital problems, segregation and volatilization of zinc. Segregation can be prevented by stirring and volatilization can be avoided by holding the charge in a cold vessel. The author described a furnace invented by Charles A. Weeks which is designed to meet these conditions.

Harrison E. Howe, National Research council, Washington, spoke on the need for co-operative research in alloys. He mentioned in some detail the efforts being made by the national research council to conduct investigations of direct value to manufacturers. He pointed out that co-operation is especially needed in regard to research work on alloys and urged that manufacturers in the foundry industry give this matter their personal attention. J. Roy Tanner, Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, submitted the report of the American Foundrymen's association committee on foundry costs. The report recommends that the association publish the standard cost system. Franklin G. Smith, Cleveland Osborn Mfg. Co., Cleveland, as chairman of the publicity committee of the Foundry Equipment Manufacturers' association, spoke on publicity work of that association.

Gary at Washington

Washington, Oct. 1. (By wire.)—Judge E. H. Gary, chairman of the Steel corporation, appeared this morning before the senate committee on labor and education which is investigating the steel strike.

Judge Gary and party of Steel corporation officials arrived from New York last night and this morning were ready for Judge Gary's appearance before the senate committee. Accompanying Judge Gary from New York were Richard V. Lindabury, general counsel; John Reis, vice president; James B. Bonner, Washington representative; W. J. Filbert, comptroller; C. L. Close, manager of the bureau of safety, sanitation and welfare, and others.

Du Puy Resigns

Herbert Du Puy has resigned from the chairmanship of the Crucible Steel Co. of America, Pittsburgh, his resignation taking effect Oct. 1. Ill health was given as his reason for retiring. His action follows a number of recent changes in the directorate and stock ownership of the company.

Handling Foundry Jobs By Crane

Classification of Patterns Will Aid Materially in Checking the Cost of Castings and in Systematizing the Usual Foundry Operations — Hoisting Equipment is Indispensable for Producing Maximum Results

BY W. C. BRIGGS

LABOR costs are fast becoming a big problem with all foundrymen. They exist from the time the raw materials arrive until the finished castings are loaded. In order to reduce the number of common laborers to a minimum, designers give entirely too much consideration to the handling of raw materials, loading of castings, etc., where the total pro rata cost per ton is a much smaller factor than the skilled workman's time on the molding floor.

This, of course, is not true in all cases, but is apt to be true in the case of the jobbing foundry where the owner or engineer has in most cases failed to find a means for making a layout of the foundry with foundry floors, cranes, hoists and molding machines so combined that they are adapted to handle to advantage a predetermined class of work.

If, however, each pattern when received is placed in a definite classification as outlined in the accompanying table it will be possible to use hand molding and hand lift where it can be used with the highest efficiency, and hand molding and crane equipment where it will be more efficient, and likewise machine molding and hand lift where these factors can be combined to produce the largest tonnage.

Tag Patterns According to Classification

The writer has not intended to carry this classification into all the sizes of flasks or depths of cope and drag that some foundries no doubt find it advisable to classify, but sufficient to outline the general scheme. The plan proposed is to place this classification list in the hands of the patternmaker or the man who has charge of the flasks so that suitable tags or stencilled markings may be applied to the individual patterns.

Tonnage of casting is influenced largely by the ratio between the size of the flask and the weight of the casting and the cost of molding follows in much the same ratio. Therefore with a system of this kind, the matter of setting the price is simplified. For instance, if a casting weighing 50 pounds is produced in classification No. 1, the same casting produced in class No. 2 would cost more, and by keeping the cost of castings made by each classification, a table soon could be prepared that would be of great assistance in estimating the cost of making all kinds of castings.

Of course there are many other elements that enter into the cost, but most of these elements do not influence the price anything like the ratio between the size of flask, which governs the amount of labor to a large extent. It is realized that green sand and dry sand molding costs vary, and that the kind and size of cores are important elements.

These classifications also will help to solve the cost problem which has

A paper presented at the annual meeting of the American Foundrymen's association, Philadelphia, Sept. 29-Oct. 3. The author, W. C. Briggs, is associated with the Shepard Crane & Hoist Co., New York.

FIG. 1—THE WORK NOW HANDLED BY THIS CRANE FORMERLY WAS HANDLED BY A JIB CRANE. PRODUCTION WAS INCREASED 4 TIMES BY THE USE OF THE CRANE SHOWN

Method for Classifying Patterns

Class	Size of Flask	Hand Molding		Machine Molding	
		Hand Lift	Crane Lift	Hand Lift	Crane Lift
1	18 x 18 x 6	1—HMHL	1—HMCL	1—MMHL	1—MMCL
2	18 x 18 x 12	2—HMHL	2—HMCL	2—MMHL	2—MMCL
3	24 x 24 x 6	3—HMHL	3—HMCL	3—MMHL	3—MMCL
4	24 x 24 x 12	4—HMHL	4—HMCL	4—MMHL	4—MMCL
5	24 x 30 x 6	5—HMHL	5—HMCL	5—MMHL	5—MMCL
6	24 x 30 x 12	6—HMHL	6—HMCL	6—MMHL	6—MMCL
7	36 x 36 x 6	7—HMHL	7—HMCL	7—MMHL	7—MMCL
8	36 x 48 x 8	8—HMHL	8—HMCL	8—MMHL	8—MMCL
9	36 x 48 x 12	9—HMHL	9—HMCL	9—MMHL	9—MMCL
10	48 x 48 x 8	10—HMHL	10—HMCL	10—MMHL	10—MMCL
11	48 x 48 x 12	11—HMHL	11—HMCL	11—MMHL	11—MMCL
12	48 x 60 x 12	12—HMHL	12—HMCL	12—MMHL	12—MMCL
13	60 x 60 x 12	13—HMHL	13—HMCL	13—MMHL	13—MMCL
14	60 x 72 x 12	14—HMHL	14—HMCL	14—MMHL	14—MMCL

been found so difficult in foundries turning out a large variety of work. It is a well known fact that there is a limited amount of foot pounds of work for every man. It varies somewhat with the man, but just as sure as a man's energies are properly applied, just as sure will he produce more and better results. If it is necessary for a molder to go to the pattern loft or flask shop to get his pattern and then to select or fit up a flask or assist the patternmaker or flask man to do so, and then get his floor ready, cut up his sand, find the necessary rigging, gagers, etc., he is not going to get started to make his job with as much dispatch as he would if a system was used whereby these factors were taken care of in a systematic way. There may be some work that can be rammed by hand or by treading in with the feet at as low a cost as can be done by any other method, but such jobs are few and far between and a good skilled mechanic should never be used for that kind of work.

As many modern foundries are designed light is the main consideration. Those that make a large variety of work from castings weighing a few pounds to those weighing several tons frequently do not have facilities for handling the kind of work they are to make. Often no attempt has been made to establish even approximately the floor area required or handling facilities best adapted for the particular kind of work to be made because the designer did not have a clear conception of the size and weight and volume of each kind of casting to be made. If, however, the pattern is classified when received or made, into the size of flask which automatically establishes the approximate volume of sand and weights to be handled, the problem of designing the building, distributing the work, providing molding machine and crane equipment can readily be solved.

The work shown in the foundry, Fig. 1, was formerly made under a jib crane. Three men had to put in a long hard day to produce nine or 10 molds. This job was fitted up to be made on a molding machine and an electric traveler arranged with controllers operated by pendant cords designed so that any one of the men in the gang could handle the flask to the molding machine and mold to the floor was provided. After one man had placed the cores, another could operate the traveler and close the mold, two additional men were added tc the gang making five men to serve the molding machine, set the cores and close the mold. The men produced 44 molds for a day's work and did not work as hard as with the old combination, producing less than one quarter of the number of castings.

Fig. 2 shows a foundry with a central bay served by travelers placed on two levels. On the lower level are three 3-motor electric cranes, arranged for control by pendant cords from the floor, each crane having a capacity suitable for handling the largest mold to be made, but not largely in excess of the capacity required. On the higher level the cage-operated machine is of higher speed

FIG. 2—CENTRAL BAY OF FOUNDRY SERVED BY CRANES ON HIGH AND LOW RUNWAYS. THE THREE CRANES OPERATING ON THE LOWER LEVEL ARE USED IN CONNECTION WITH MOLDING

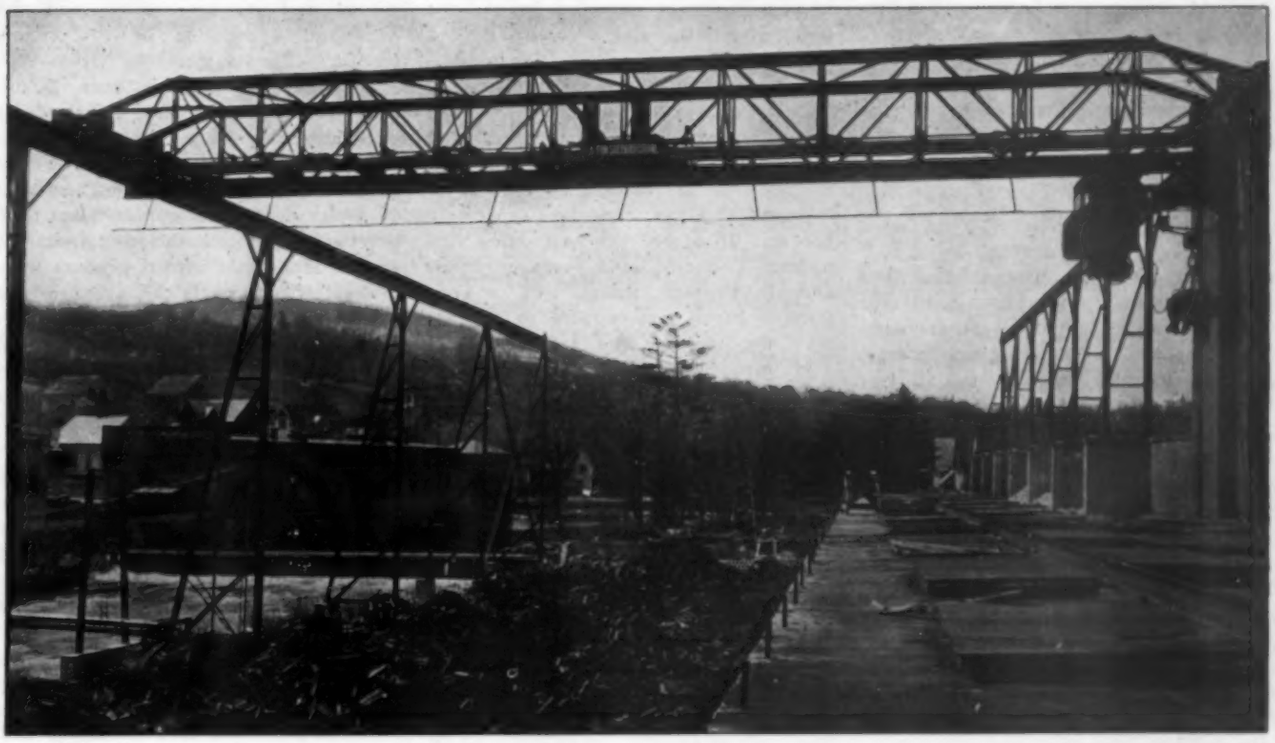


FIG. 3—MATERIAL STORAGE YARD OF FOUNDRY WHOSE INTERIOR IS SHOWN IN FIG. 2. MATERIALS ARE HANDLED BY THE CRANE AND MONORAIL HOIST SHOWN

and is used largely for distributing flasks, taking out castings, and when necessary, carrying large ladles of iron over the top of the lower cranes without interfering with the molding operations. The side floor of this foundry is equipped with two 2-motor electric travelers, arranged for control by pendant cords. These machines are of light capacity, designed to perform the particular operations required of them. The core room, extending the whole length of one side of the foundry is served by a light capacity quick-acting overhead traveler.

The crane equipment in this foundry is nearly ideal, but by applying the system of classification of patterns and by making a study of the average number of castings made in definitely established flasks and by selecting the best molding machines for the work, a much larger tonnage could be produced with the same number of men. While the item of handling materials is low per ton of castings produced, many foundries are operating with high costs that can be lowered economically by the application of properly selected handling equipment.

Fig. 3 shows the material storage yard of the foundry shown in Fig. 2. Pig iron, coke, sand, etc., are moved mechanically throughout. Pig iron is unloaded from the cars by magnet to the yard and as required delivered to the charging platform by the crane and monorail hoist, clearly shown in the illustration. The only man labor is used in charging the cupola from the scales located on the platform.

Efficiency engineers have done much to lighten the burden of the manufacturer and the man who does the work but it is no easy task to get these parties thinking along the same lines. Many foundries, especially the jobbing foundries, can greatly increase their production and make the job easier for both owner and workmen by giving more careful study to the pattern before it goes to the foundry and by standardizing flasks and then allotting as far as possible, definite floor space, suitable handling facilities and molding machines for the work.

Electric Furnace an Adjunct to Cupola

BY GEORGE K. ELLIOTT

THE advantages of a duplex process using the electric furnace as an adjunct to the cupola for melting gray iron were outlined by George K. Elliott in a paper presented at the annual convention of the American Foundrymen's association held in Philadelphia, Sept. 29-Oct. 3. The author called attention to the fact that while the cupola is an efficient furnace for melting iron it has certain limitations which prevent it from furnishing an iron which entirely meets the requirements for certain classes of castings. But for the ordinary run of iron castings, comprising possibly 90 per cent of the total output of the country there was said to be no valid economical reason for either displacing or radically modifying the modern cupola.

The author goes on to say that whatever its faults may be, it must be acknowledged that for preheating iron up to the point of melting, and after that performing the fusion itself with a minimum waste of heat, the cupola stands supreme among the established foundry furnaces. Its melting efficiency approximately is 40 per cent although in the hands of the unskilled it may fall as low as 25 per cent, while the adept may drive it along at a rate of as high as 50 per cent efficiency.

Although the cupola is practically

without rival as a preheater and melter it does not attain the same high rank as a superheater of molten metal. The cupola operator's problem in obtaining superheated iron is largely one of circumventing terrestrial gravitation as it is manifested in the speedy dripping of the molten iron through and away from the hottest zone of the cupola.

In the two-step process that has been described, all responsibility for superheating is taken from the cupola and assigned to the electric furnace, where with the greatest ease it can be superheated to a degree that is not possible in any other kind of furnace. Superheating in the electric furnace enables the foundryman to make castings of low-phosphorus iron which otherwise it would be necessary to make of high-phosphorus iron, because he can safely shift the responsibility for fluidity from the material to the furnace.

Another advantage, and by no means a minor one, is that hot iron tends to increase solidity in castings. By solidity is meant not only closeness of grain but freedom from internal imperfections such as blowholes, shrink-holes, slag inclusions, graphite segregations, or like defects.

The process of treating iron in the cupola cannot be extended beyond the point of melting and a certain limited amount of superheating. Any additional operation such as refining, is entirely out of the question and can be performed only in some other kind of furnace. In considering the electric furnace in relation to refining it is preferable to consider separately the acid-lined and the basic-lined furnaces. The acid-lined furnace refines entirely through maintaining a constant reducing atmosphere in contact with the metal. The refining in an acid furnace is one of deoxidation coupled with a freeing of the bath from included gases and slag.

One must turn to the basic-bottom electric furnace to find potentiality in refining at its greatest. Almost any metallurgical reaction may be conducted in it, including oxidation, reduction, dephosphorization, desulphurization, decarburization, carburization, mixing with ferroalloys, superheating, and others. The duplex process for cast iron is chiefly concerned with reduction, desulphurization and mixing.

Standard pig iron containing a maximum of 0.05 per cent sulphur contains from 0.07 to 0.11 per cent after coming from the cupola, the degree of contamination depending upon the quality of coke, the condition of the cupola and its accessories, and the skill and knowledge of the cupola tender. The same iron from the cupola may subsequently have its sulphur reduced to about one-third or one-fourth by 30 or 40 minutes refining in a basic bottom electric furnace. The average of a great number of *duplexed* heats of gray iron was 0.088 per cent sulphur in the melt from the cupola, while in the final product from the electric furnace the average was 0.036 per cent. As low as 0.009 per cent sulphur in occasional heats has been produced in gray iron under everyday working conditions with little difficulty.

The electric furnace step of the duplex process is particularly good for mixing. It enables a perfect mixing of the original raw materials, assuring homogeneity in the single heat, and it facilitates the accurate duplication of results, assuring uniformity among several heats. It also simplifies and insures the perfect admixing of alloys such as ferrosilicon and ferromanganese. The electric furnace allows steel scrap to be mixed with the iron and by this means the amount of total carbon in the metal can be controlled, while when steel scrap is mixed with iron in the cupola an indefinite amount of carbon is taken up from the coke.

Educational Value of the Scrap Pile

BY HENRY TRAPHAGEN

DEFECTIVE castings—the tenants of the scrap pile—offer to the discerning and ambitious foundryman knowledge that is beyond price. The real value of the scrap pile depends upon whether the defective castings are intelligently examined or whether they are buried away under old barrels. Intelligently examined and constructively criticized, a defective casting will invariably point out the antidote.

The up-to-date foundry should have at least one competent, experimental molder, who is paid by the day, and not hurried; his business should be to investigate the proper method of gating and heading castings as they come into the shop. When the casting comes right, then it should be either sketched or photographed with the gates and heads attached, and a permanent record made. If the same job comes back a year or two later it is immaterial whether the experimental molder is in China or the superintendent in parts unknown; that casting can be made again, for the method of making it is on record.

Show Characteristic Defects

At first sight, it appears that experimental molding is an almost endless task; that the experimental molder has to start out on an entirely new task every time a casting comes into the shop, and that the number of records necessary is almost overwhelming. However, if foundrymen will carefully investigate this method of experimental work, they will find that after all, the number of real basic defects that are found in castings are comparatively few. They will discover that castings naturally group themselves into a few well defined classes, and that each class is subject to characteristic defects that are easily recognized, and in a short time they will learn to discount possible defects at the start.

Several fundamental difficulties that are met in foundries have been described in the literature on the subject; but unfortunately these descriptions seem to be lost in a maze of words dealing with the various peculiarities of chemical ingredients, new methods of chemical analysis, long discussions on grain aggregates, and in fact, almost everything except a frank, plain discussion of the foundryman's troubles.

If the foundryman will carefully study his defective castings the writer believes that he will ultimately find that all of the defectives can be traced to one of the following fundamental errors:

First—The personal equation, or in other words, the carelessness of the workman.

Second—Over-production, which puts a premium on careless, sloppy work.

Third—The attempt to make good material out of junk.

Fourth—False economy, which results from the use of too little fuel, too much scrap, cheap refractories and too

Abstract of paper presented at the annual convention of the American Foundrymen's association, Philadelphia, Sept. 29-Oct. 3. The author, Henry Traphagen, is metallurgist of the Toledo Steel Casting Co., Toledo, Ohio.

great a reliance in green sand molding practice.

Cold iron due in a false economy in the use of fuel is a common error. It is a simple matter to determine whether or not the bed is low. Leave the tap hole open, turn on the blast, and note the time that it takes for the first metal to run over the spout. If iron appears in less than 10 minutes, it is almost a certainty that the bed is too low. A low bed means dirty, porous, weak castings, owing to the metal melting directly in front of the tuyere blast and becoming unduly oxidized.

Another prolific source of cold metal lies in the attempt to conform to a prearranged melting ratio. In the dictionary of common sense there is no such term as melting ratio. The correct melting ratio is the amount of coke that will give hot, fluid metal; and this amount of coke will vary with the size of the cupola, the amount of scrap used, the kind of coke, the percentage of steel used in the mixtures, and the size and condition of the sprues. It is therefore evident that it is ridiculous for anyone to attempt to lay down a specific melting ratio for cupola practice.

Cold metal in the converter can generally be laid to one or two causes. The metal from the cupola may be cold for one of the reasons just enumerated; the percentage of silicon may be too low for successful blowing, or what is most common, the lining of the converter may be too wet, or there may be a leak in the wind chest or somewhere along the line. It is rarely found that cold metal can be traced to a variation in chemical content, and before the foundryman wastes any time fooling around the laboratory, it is far better for him to examine his cupola practice, his converter linings and his wind apparatus.

There is another great fundamental cause for cold iron, it is found not only in the cupola, but in the converter, the air furnace, the open-hearth furnace, the crucible furnace and even in the electric furnace. Reference is made to the effects of oxygen which causes oxidized metal. There is no disputing the fact that foundries very frequently receive shipments of pig iron that will not produce hot iron, no matter how careful the melting practice may be.

If, on breaking a shipment of iron it is found to be consistently unsound and full of gas cavities, reject that iron if it is possible to do so. But if the furnace absolutely refuses to take such iron back, which often is the case, then the only course left to the foundryman is to hold the shipment in the yard and use it very gradually, say one pig to a charge, until the pile is gone.

Another source of cold, sluggish iron and steel lies in the use of thin, dirty, rusty scrap. Such material is finely divided. During the melting process this rust or oxide enters the metal and becomes emulsified. No amount of fluxes, deoxidizers, or other cleansing agents will get it out. I believe suspended oxides in metal are causing more trouble today in the iron and steel industry than any other one thing. The use of such material is directly at variance with all the sound principles of metallurgy. Cold metal affects the molding department so strongly that the molder must take it into consideration. It is a well known fact that the moment molten metal strikes the sand a large volume of gas is generated. This gas is formed from the decomposition of binding materials, but most of it comes from the water in the sand.

If such gas is not allowed free exit, it is going to be trapped in the metal, the colder the metal is the more quickly it will set, and the more likely it is that the gas will be trapped under a frozen skin; this is a very common defect in green-sand molding; hence the necessity when attempting to make green-sand work, of having the metal very hot and fluid and venting not only the cope but the drag, and making sure that the vents in the cores are wide open.

The Sins of the Cover Core

An interesting sidelight in connection with this discussion is the question of using oil-sand cover cores. It is a very common occurrence to find a casting made under a thick, hard oil sand cover core, with absolutely no provision for the escape of gas. The foundryman struggles along and probably gets two out of ten castings, whereas if he would merely puncture the cover core with three or four pop heads and let the gas out, the probabilities are that all of the castings would come good.

The question of shrink heads or risers is one that is given too little consideration in the foundry. A head to be of any value, must be large enough in cross section to remain open until the casting has set. It is well to remember that probably not over 30 per cent of the cross section of a head is available for feeding and this statement applies with more than ordinary force to the neck of the feeder; it is folly to make a great big head and then neck it down so narrow that the neck freezes almost instantly, and it is equally futile to expect a head to feed if it is not placed squarely upon the casting. How often does one find a head with a neck say 2½ or 3 inches in diameter about one-fourth of which is attached to the casting and the rest wandering off in space.

A casting may look sound, but millions of tiny bubbles of exploding steam have made it porous so that it will not stand up under gas or water pressure. It is possible to make hydraulic castings in green sand molds, but it is not possible to make them day in and day out and be fairly certain that they are all sound. It is almost an impossibility to control the water in the green sand mold; and water suddenly converted into steam has a habit of exploding in the most unforseen places and in the most peculiar ways. As a general rule, a hydraulic or gas casting should be made in a thoroughly baked mold; if proper materials are used, the melting carefully done and the mold kept clean, there is no trick in turning out acceptable hydraulic castings.

There is one more item in the molding department that deserves attention and that is the proper method of pouring. The scrap pile receives a great many contributions because of the carelessness or incompetency of the man at the ladle. Every ladle of metal should be held for a minute or two to allow the slag and other impurities to come to the surface. Metal going into a sand mold should be poured evenly and carefully and under no consideration should hot metal be poured at high pressure directly over a large flat area of sand. Cuts and scabs and snakes are too often the result of fast, furious pouring. It is far better when dealing with a casting having a large flat surface, to cut back-up gates and break the force of the stream of metal rather than resort to a mass of finishing nails, a lot of swabbing to prevent the facing from cutting.

Another exceedingly common error is the practice of pouring metal at right angles directly up against a core. If it is possible to allow the metal to slide parallel to the core, there will be far less cutting and much less dirt.

The value of a scrap pile lies in the fact that it offers a real course of instruction in foundry practice, and this paper has been written in an attempt to induce the foundryman to commune with his defectives, to study their peculiarities, to grasp the principles of casting in their broadest sense, and to realize his responsibility to the community.

Audible Signals in the Foundry

Acoustic Devices Including Electric Horns, Steam and Air Whistles, Bells and Gongs Afford Economy, Efficiency and Safety of Operation—Description of a Code-Calling Instrument—How to Select Proper Signals

BY VLADIMIR KARAPETOFF

IN various foundries the following types of audible signals are actually in use: Electric horns similar to those used on automobiles; air or steam whistles, sometimes electrically operated from a distance; and bells and gongs, either single stroke or continuous. In an efficient up-to-date foundry such audible signals should be used for at least the following purposes:

1—For calling any important employe to the nearest telephone no matter where he may be; this presupposes a prearranged code and some simple device for sounding calls.

2—As extensions to telephone bells in noisy places; a foreman may not hear his telephone bell when away from his desk, but he would most likely hear one or more loud horns or shrill whistles mounted in the shop.

3—For purely local needs and signals, for example, to indicate the beginning and the ending of pouring, to call a craneman or an electrician to some prearranged place, etc.

4—As warning signals of danger on cranes, hoists, locomotives and trucks, especially when a ladle with molten metal is in motion.

5—For sounding fire-alarms.

Imagine yourself sitting as an observer in the molding and pouring department of a large foundry properly equipped with audible signals. You will soon hear one or more electric horns sounding a code number, for example, one, one and two (1-1-2). This may mean that the superintendent is wanted in his office, but that there is no particular hurry about it. Had the call been one, two, two (1-2-2), it would have meant a hurry call and you probably would have seen the superintendent running to the nearest telephone.

Soon afterward you may hear two long blasts of an air whistle, signifying that everything is ready for pouring in the north aisle. A few minutes later it might be followed by a continuous ringing of a bell to warn the workers that a big ladle full of molten metal is being carried by the crane.

To make the picture complete, let us imagine that after a time you hear a single-stroke gong sounding number four three (4-3). This may designate a fire in the pattern shop, or many simply be an agreed call for a fire-drill.

By Way of Contrast

For contrast, let us go to an out-of-date, shabby, primitive foundry, which is still running on the "chance and luck" principle, found to be satisfactory by our forefathers. In those days a molder received a dollar or two for a 12-hour day, and the output was measured in pounds where it is now stated in hundreds of tons. Two or three office boys are running all over the works trying in vain to locate the superintendent who is needed in the office to help on an important quotation. When he is finally located, it is too late to take care of this matter in the proper way. A millwright is needed in a hurry to take care of a hot bearing on a rush job, and nobody knows where he is. He happens to be attending to an unimportant job in a dark pit, and is blissfully ignorant of the fact that he is urgently needed elsewhere.

Actual experience not only in foundries but in all kinds of industrial establishments has demonstrated the importance of audible signals in promoting both the efficiency and the safety of operations. Horns, bells and whistles are simple pieces of apparatus available on the market. Their cost is trifling in comparison with their useful service, and any far-sighted foundry manager can readily see the great advantage of equipping his works with acoustic signals, once the matter has been properly brought to his attention.

The following are the principal *sources of noise* in a fully equipped foundry:

Molding Department.—Vibrators for loosening sand from patterns, jar-ramming machines, cranes, trolleys, hissing of compressed air; noise of conveyors, trucks, wheelbarrows, etc.

Cleaning or Trimming Room.—Tumbling barrels, air chisels, pneumatic drills, grinding wheels, scrapers, band saws, conveyors, sand-blast machines, hissing of escaping air.

Sand Mixing Room.—Gears, chains, disintegrator hammers, magnetic separator for iron stays, and electric motors.

Melting Room.—Roar of blowers and of combustion (especially when burning oil); cranes and conveyors. Not very noisy.

Core Department.—Hammering, jar-ramming machines, escaping air, gas or oil furnaces, sand conveyor, a traveling crane and trucks.

Welding Department.—Roar of the oil-burning furnaces for preheating defective castings; hissing of the oxy-acetylene flames; handling, hammering and dragging of castings.

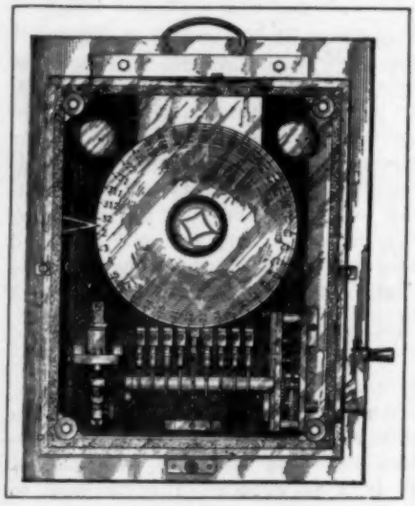


FIG. 1—A CODE CALLING MECHANISM

The operator sets a code number and pulls on a handle. This closes the electric circuit the required number of times, and sounds the signal.

Fig. 1 shows a simple device for sounding simultaneously any desired number of horns, whistles and gongs scattered throughout the works, and for calling various persons according to a prearranged code. The electrical connections are shown in Fig. 2. The device consists essentially of a number of toothed wheels which close and open an electric circuit in a certain sequence. These wheels are mounted on a shaft operated by a clock spring. A drum is provided with a combination of 40 simple arrangements of contacts, such as 1-2, 1-3, 2-3, 1-1-2, etc. The horns are connected to an available 110 or 220-volt circuit either direct or alternating current while only a small current from a few dry cells is used in the central instrument. This current closes a relay which operates the power circuit between

From a paper presented at the annual meeting of the American Foundrymen's association, Philadelphia, Sept. 29-Oct. 3. The author, Vladimir Karapetoff, is professor in the electrical engineering department, Cornell university.

two contacts especially designed for frequent opening.

When it is desired to call some person, the code handle *A* is set on the number assigned to that person, and the operating handle *B* is turned by one-half a revolution. This is all the operator has to do. The contact shaft is set in motion by the spring and the circuit is closed a certain number of times in acordance with the position of the code drum. Every time the battery circuit is closed the relay closes the power circuit and operates all the horns, whistles, gongs or lamps connected to it. Having sounded the complete call three times the handle *B* returns to its original position and the mechanism is ready for the next call.

In most cases it is considered sufficient to sound the call number three times. The first time the person may not be sure whose call it is, the second time he counts the sounds and the third time he checks himself. For exceptional purposes, the call may be sounded more or less than three times or even continuously until stopped.

How the System Operates

The operation of the code-calling mechanism is usually entrusted to the telephone operator, where a private branch exchange is available. If the manager needs Mr. Jones and fails to reach him by telephone at his desk, he tells the telephone operator to sound his call number. Mr. Jones may be anywhere in the works, but as soon as he hears his number he comes to the nearest telephone and reports to the telephone operator who immediately connects him with the manager's telephone. Special cases have arisen in which the operation of the code-calling instrument had to be entrusted to a clerk in the superintendent's or production manager's office, in order to prevent office boys, clerks, etc., from disturbing important members of the staff on trifling occasions. The operator of the calling device is supposed to inquire about the nature of the business before starting the call.

When the number of persons to be called is not great, say 10 or 12, it is sometimes convenient to assign two or three different numbers to the same person. These three numbers may mean respectively: (1) "Call me on the phone immediately;" (2) "Call me when through with the present engagement;" (3) "Come to the manager's office."

The particular rules for the use of the code-calling equipment differ from factory to factory in accordance with the local conditions, and may be modified from time to time as actual experience indicates.

Some care must be exercised in the selection of the type of sound-producing signals and of the number of such devices in each department. A buzzer or a bell would not be heard near a tumbling barrel or a sand disintegrator; on the other hand, a powerful electric horn would be out of place in an office. Each signal must be distinctly heard under the most intense noise possible in that department by a person most unfavorably situated with respect to the signal. At the same time it would be a mistake to use unnecessarily strong signals, which are liable to get on the workers' nerves.

The pitch of the signal (high or low voice) is another factor to be considered, and while no accurate experiments are available, the selection should be governed by the principle of contrast. In a shop with a low-pitch rumbling and howling noise a shrill signal is more liable to be heard, and vice versa. Again, where the noise is of a discontinuous percussion type, like hammering or riveting, a horn with its steady sound would immediately attract attention. On the other hand, where the noise is continuous like that of a blower, a loud single-stroke bell might cut through the noise more readily.

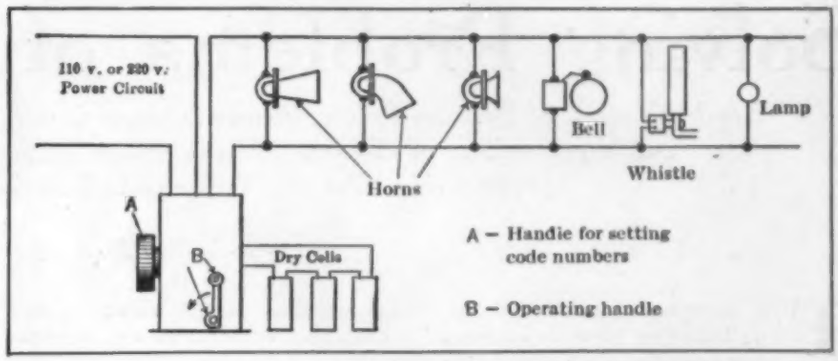


FIG. 2—THE ELECTRICAL CONNECTIONS FOR THE CALLING MECHANISM
A local battery closes a relay, which in turn closes the power circuit, to which the audible devices are connected in parallel.

Training Foremen to Lead Enlightened Labor

"The low educational caliber, in economic matters, of the foremen in most of our industries is remarkable, considering the effective part they might play in happily adjusting industrial differences at their inception," says John Calder, consulting engineer, New York, in a paper read before the American Foundrymen's association at its annual meeting in Philadelphia, Sept. 29-Oct. 3.

"This is not wholly the fault of the foremen," he continued. "They are usually selected largely for their technical proficiency in their own particular branch and then are forgotten by the management so far as the engineering of men is concerned. The generous treatment of foremen and the steady drawing-out of their capacities for leadership and for interpreting to workmen the policies and ideals of liberal-minded owners is the open secret of some of our most happy and contented businesses."

Favors Industrial Representation

Mr. Calder, who wrote on the subject, "Industrial Democracy and the Foreman," said that much good may be accomplished by means of the democratic form of representation in industry, but that its possibilities are limited unless foremen bring economic education into the meetings of shop committees. His views in this respect are opposed to those of some industrial concerns which, in extending representation to their workmen, have made it a point to exclude foremen from membership in committees, on the grounds that workmen consider them representatives of the management.

This is a point on which there is some difference of opinion, but as Mr. Calder goes on to say: "Certain it is that no ideas which we fail to sell to our foremen can be permanently conveyed to our workmen, and while a wealth of endeavor is being expended on the moving soil of labor at present we should not overlook the permanency of a liberal investment in the education of our numerous minor executives."

Mr. Calder, who has conferred with several thousand executives and foremen affiliated with industries in ten states on employe representation and the training of foremen, states that good results are obtained with intensive three-month courses for foremen, in which the principles of human engineering are presented in interesting form. He displays a sym-

(*Concluded on Page* 903)

Solving Problems of Personnel

Establishment of Definite Policy, Proper Interpretation of the Policy and Practical Application of Details, Three Most Important Factors in Securing Proper Industrial Relationship

BY C. D. DYER, JR.

THE consummation of satisfactory industrial relations requires hearty co-operation from all concerned. It is not enough that the employer should comprehend the viewpoint of the employed. The latter must with equal candor appreciate and accept the ideals and purposes of the former. No common interest can or will exist unless it is based upon mutual understanding and respect. Once a common purpose is established, misunderstandings, as a rule, can be quickly and amicably adjusted.

The three most important factors in securing and retaining a proper industrial relationship are the establishment of a definite policy, which is not easy; the proper interpretation of such policy, which is even more difficult, and the practical application of details in connection therewith, which is vital.

Too much consideration cannot be given to the problem of establishing a definite policy. To be of value, it must be formulated with the idea in mind of permanency, rather than expediency. It must provide sufficient elasticity to readily meet local or changing requirements. Any plan bordering on the paternalistic, philanthropic or welfare type of relationship, that has given rise to so much misunderstanding in the past, must be avoided.

Must Present Opportunities to All

Certain general provisions are necessary. Opportunity should be presented to every member of the industry, be he employer or employed, for advancement, financial remuneration, and development as a citizen and community member, according to his contribution to the industry and to society at large. Multifarious complications enter into the drafting of a just system of rewards. For this reason, an intensive study of every phase of the situation should be made. This may be termed the merit system, but whatever its terminology, it is essential to mutual understanding.

The fact that an adequate return on investment must be forthcoming and that sufficient capital resources are essential prerequisites to the development and extension of industry and the weathering of lean periods, must be mutually recognized. This principle may be termed the proprietary factor of safety. It is, of course, directly interlinked with a just system of rewards. Mutual recognition of these inseparable factors is essential to mutual confidence.

The policy should embrace the teaching of the principles of Americanism throughout the organization. There are in our midst those who either cannot or will not subscribe to anything constructive. We all must acknowledge that this condition is one of the most serious problems of both employer and employed. The first type will be taken care of by the employed, provided the right atmosphere is created. Disloyalty and unsound thinking will never flourish in American industry if the environment is right, even though they at times appear to be taking root.

Men of the second type, who, by reason of earlier lack of advantages and education, have not the mental capacity to grasp the essentials of and necessity for American citizenship, present a problem requiring constructive and persevering effort that cannot be sidetracked. Coercion is not the remedy. The creation of the desire through precept and example is the initial requirement and furnishes the basis for an actual solution through educational means of a more tangible nature later. It is essential that this important provision be given especial consideration. The fact that these types are in the minority permits an approach to a common interest goal to a certain extent, but much constructive work is needed before all types of employed, and in many cases employers, will have their vision so developed as to grasp the principles of the square deal as interpreted in this country, when they are at hand.

Proper representation of both employer and employed in the formulation of the policy is advisable. Such a procedure will assist in determining a basis of common interest founded on mutual appreciation of the problems of both, and will aid materially in furthering the aims of the policy.

Unless these four principles form the basis of a policy, interpretation and practical application become makeshifts. Strong personalities may triumph temporarily, but the structure created on a poor foundation cannot permanently withstand the storms that it must weather.

The size of departments handling industrial relations varies from one man in a small plant to large numbers in large industrial establishments. It is customary in the latter to have several highly specialized subdivisions, with a functional type of organization. The usual subdivisions are employment, service, and hospital; further functionized as follows:

EMPLOYMENT—This function usually embraces recruiting, hiring, adjustment of problems arising out of and in the course of employment, and discharging.

SERVICE—Under this function is usually included safety, compensation claims and adjustments, housing, washrooms and lockers, transportation, legal aid, loans, education, mutual benefit and other employes' insurance societies, employes' activities—religious, musical, social, athletic, etc.—Americanization training and assistance in securing citizenship papers, commissary, cooperative stores, publications and general service to employes.

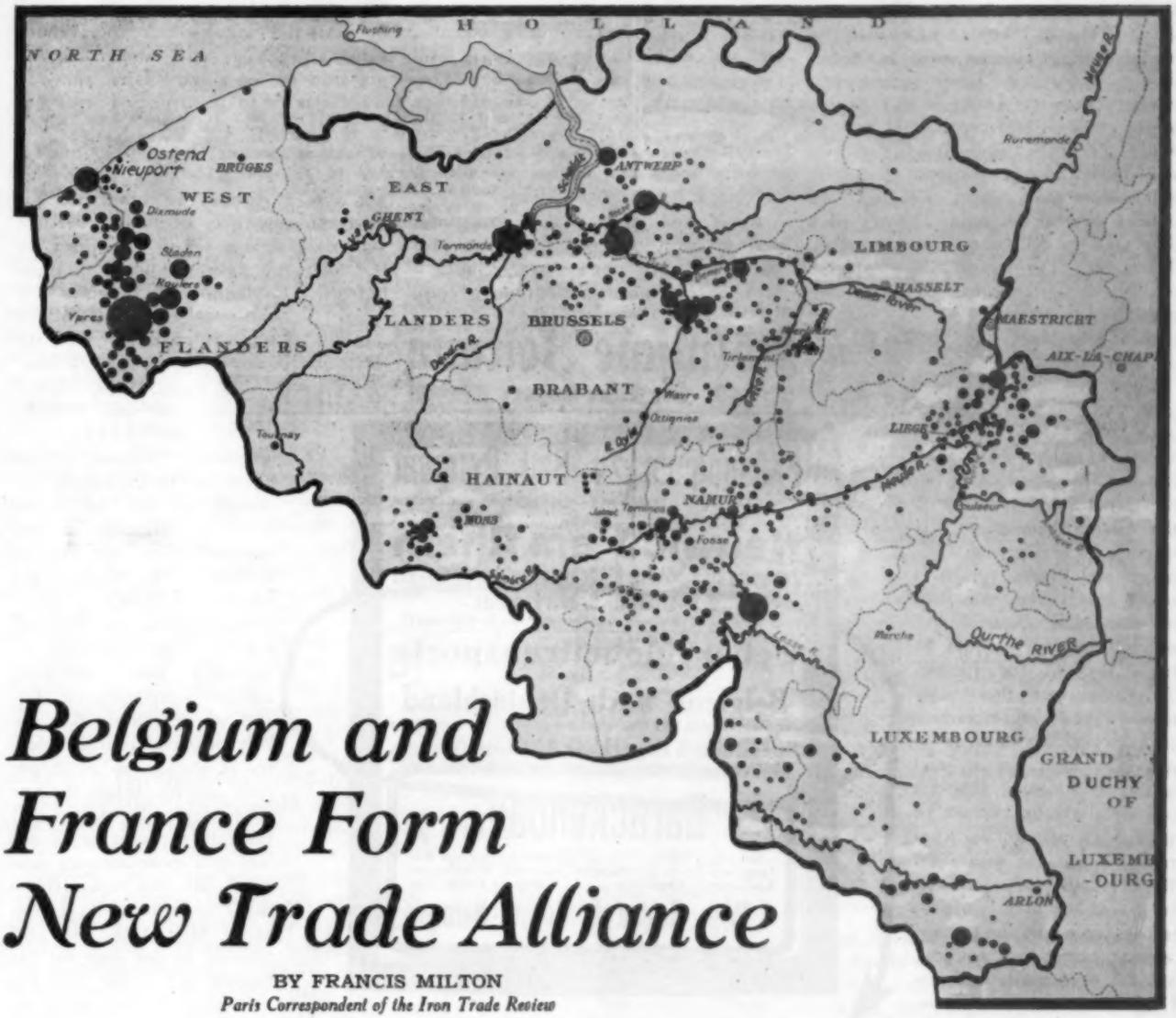
HOSPITAL—This function usually includes medical, surgical, dental and visiting nurse service and sanitation.

Duties of the Employment Department

An employment department is essentially a sales agency. It must have access to an available supply of its commodity for the prompt filling of requisitions of varying specifications. In its transactions it has two customers. One is the man to whom it must sell the job. At this stage careful selection is essential, because the second customer, the requisitioner, must be presented with a product which will satisfy his requirements. If both are satisfied, all is well.

However, the employment department must operate upon the principle that its customers are always right. Goods falling short of specifications are returnable. It must stand behind its sales and be prepared to make all necessary adjustments.

From a paper presented at the annual meeting of the American Foundrymen's association, Philadelphia, Sept. 29-Oct. 3. The author is a member of Hunt & Dyer, Philadelphia.



Belgium and France Form New Trade Alliance

BY FRANCIS MILTON
Paris Correspondent of the Iron Trade Review

DESPITE trade jealousies that existed before the war, France and Belgium have joined hands for their own economic welfare. The writer heard the speech of welcome made in Brussels to President Poincare of France, and also heard the reply. Politics apart, the speeches may be said to have argued for close economic and trade co-operation. King Albert said:

"Belgium more than ever counts on the support of France to assure the benefits of peace, and to aid in achieving happy and profitable commercial relations. This reconquering of economic life which has been so sadly ruptured is one of mutual interest."

The reply of President Poincare was in part as follows:

"France will never forget that it was Belgium that held back the first tidal wave of German imperialism. In the light of this inextinguishable remembrance the two countries should go hand in hand to the solving of their contiguous commercial and economic problems so indissoluably bound up, one to the other."

This, in a nutshell, is the commercial aspect of the period of reconstruction of Belgium. "Contiguous commercial and economic problems" is something more than a phrase. Both French and Belgian iron and steel and coal and coke companies have their interests as often on one side of the frontier as on the other, and sometimes on both.

The great Ougree-Marihaye Co., with its plant on the Meuse has its mineral deposits on French territory, and if it was put to the necessity of paying an export tax on its own mineral brought from France there would indeed be a lack of "a happy commercial *entente*," to quote further the words of King Albert. This was just the point of view that was expressed to me by the director of the Ougree-Marihaye company

Another question which is potent with possibilities for the future prosperity of Belgium is the freedom of

THIS is the second article of the series descriptive of Belgium industry written for THE IRON TRADE REVIEW *by its Paris correspondent, Francis Miltoun, who made an extensive trip through Belgium recently for the purpose of presenting an accurate word picture of the situation in the iron and steel trade. In this, as well as in the first article which appeared in* THE IRON TRADE REVIEW, *Aug.* 14, *Mr. Miltoun gives the results of a general survey of economic conditions affecting the industry. In subsequent articles he will deal specifically with the status of the leading iron and steel works, the problems with which they are contending and the extent of their success in attempting to re-establish themselves in the position they formerly occupied in the world's markets. The next article will describe the great Ougree-Marihaye Co.'s plants on the Meuse.*

the waterway of the Scheldt; otherwise, Belgium, being essentially a manufacturing country, will be tributary to contiguous ports rather than having its own. Antwerp bids fair to be the chief port of continental Europe while Zeebruge and Bruges, and a still more distant project at Ghent, will endow the country with deap-sea outlets such as no other country of a like area in all the world possesses. These are the grand lines of the renaissance of Belgium. Another suggestion is the possible conception of a triumvirate —France, Belgium and Luxemburg. The combination would have the heaviest possible weight in the metallurgical industry of the eastern hemisphere. It is doubtful if England, Germany and Spain combined could equal them, although in area and financial resources the latter would be triple that of the former. This union of three may have some argumentative justification, but France is not very keen for it, and neither is Belgium, although one or the other would be willing enough to incorporate Luxemburg separately. Doubtless the most that can be looked for here is a protective economic and commercial, rather than political, union. Free trade between Luxemburg and Belgium, with the attendant possibility of Luxemburg making use of Belgian ports as if they were her own, would prove of benefit to Belgium, and would in no way be detrimental to Franco-Belgian interests. It is evident that Belgium is bound to reconstruct its economic edifice on an entirely new base. Labor is the chief factor in industry, and labor in Belgium is today 25 per cent cheaper than it is in England, and perhaps proportionately cheaper than it is in France. Coal is the daily bread of industry. Belgium has both coal and labor in sufficient quantity and of excellent quality. If old methods have gone into bankruptcy because of new ideas evolved from the war this does not in the least affect the prime movers of industry—labor and combustibles. When we add to this, raw material in the shape of iron ore we have a formidable combination.

Belgium is well provided for. The surface of the whole fabric has crumpled like the rim of a volcano, but the mountain of energy is still there, and also, the will to do. This is the summing up of my impressions of 10 days spent among the shattered industries and institutions of Belgium, looking below the surface for a light unfogged by political issues.

Facts and figures are sometimes dull reading, but they at least give authenticity to one's observations, if they have been conscientiously compiled. The following figures summarize production as of May 30, 1913 and May 30, 1919. They are significant when one considers that as a result of hostilities coal extraction during the period of the fighting was reduced to less than one-half of what it was formerly, and that of the 60 blast furnaces in Belgium before the war but four were left intact by the invaders.

Tons	May, 1913	May, 1919
Coal	1,800,000	1,100,000
Coke	125,000	36,000
Cement	73,000	7,000
Pig iron	210,986	4,065
Steel	182,681	8
Semifinished material	127,975	3,431

Despite the wide differences in some instances, figures show an awakening of activities going back to primary sources, such as coal and coke. If pig iron makes a lamentable showing what else is to be expected with but four furnaces lighted?

Activity means prosperity, and if for Belgium this is only relative as yet, and it cannot be otherwise for many months, it is an incontrovertible sign of progress. This is shown by the following figures relating to trade between England and Belgium for February, March and April of the present year: 28,325,000, 70,265,000 and 109,450,000 francs respectively. Belgium is not likely to go backward, although as will be shown later, its situation at this moment does not appear brilliant. The *Monitor des Interets Materials*, a semi-official journal of Brussels, sets forth the following explanatory note cautioning against acceptation of figures which indicate that the Belgian metallurgical industry is already up to 25 per cent of its before-the-war production. It states that from 10 per cent to 12 per cent is a more accurate estimate. My own computations based on coke and pig iron as of May, 1913, and 1919 indicate 24 per cent for the former and 2 per cent for the latter, which gives an average of 13 per cent. The Belgian government is discussing the question of tariffs on ores which are brought into Belgium from Luxemburg. It is of prime importance that the free importation of raw material should continue. Work has been started on the reconstruction of the eight furnaces of the Halanby interests which were destroyed. The company has just acquired an ore mine sufficiently productive to keep the furnaces operating when rebuilt.

The Usines Metallurgiques du Hainault is actually producing the equivalent of that which left the plant at the latter end of 1913. Three blast furnaces are in operation, a Thomas furnace, a Martin furnace and a rolling mill for sheets at La Louvier. During the past month 12,000 tons of rails and profiles were produced, and 3500 tons of plates. The shops engaged in locomotive and rolling-stock

Sonntag, 6. Mai
Kölnische Zeitung
Erste Morgen-Ausgabe
1915 - Nr. 236
Pädagogium zu Bad Pyrmont
Neuwied am Rhein
Zehnklassige höhere Mädchenschule u. Pensionat der evangel. Brüdergemeine.
Ueber Möbeltransporte
Belgiens nach Deutschland
Speditions & Lagerhaus Akt. Ges. Aachen.
Barackenbau.
Wilh. Becher & Co., U.-Barmen.
On Transportation of Furniture
from the principal cities of
Belgium to Germany
and Austria Hungary, information and prices furnished.
Forwarding & Warehouse, Aix La Chapelle.

DURING THE WAR GERMANS ADVERTISED THEIR FACILITIES FOR SHIPPING PROPERTY STOLEN IN BELGIUM TO GERMANY

repairs for the Belgian railroads are operating at full capacity, and awaiting orders for a series of express locomotives from the government. The restitution by the Germans of pillaged and despoiled Belgian property will have not a little to do with the speed with which many Belgian manufacturers resume production. This process is slow, inasmuch as the Belgian restitution bureau at Wiesbaden is more or less dependent on the Germans making known the hiding places of the machinery stolen from Belgian factories. One hundred and twenty-two Belgian officials are traveling about Germany locating and arranging for the return of the machinery. In March, 1919, 108 tons were shipped back to Belgium and in June nearly 10,000 tons. Among other stolen articles recovered from Germany were two freight cars of Belgian postage stamps. They could hardly have been worth to Germany more than the value of old paper.

Another sign of the progress which Belgium is making toward economic recovery is the increase in the figures relating to the operation of railroads. The accompanying map shows that the devastation of Belgium during the war was much more widespread than commonly supposed. After all transportation is the soul of modern industry, and it is a sure indication of the revival when it is considered that railroad passenger receipts were 9,504,000 francs in May, 1914, and 11,202,000 in May, 1919. Freight receipts decreased from 18,787,000 to 14,370,000, although the latter figure is quite a respectable showing, all circumstances considered.

The specific needs of Belgium may be enumerated as follows, the estimate being based upon figures and facts given me by the Office Central de Reconstruction. One can well judge of the importance of the destructions and requisitions made by the German authorities when they occupied the country from the figures representing restitutions already made, and also from the figures of the official Belgian archives showing requisition vouchers and evaluations, made by experts since the armistice, of damages to the value of 5,754,000,000 francs. These figures apply only to industry, and do not include personal property losses. The needs of Belgian industry in order that the wheels may again turn profitably are collated as follows:

COAL AND MINING INDUSTRY: Has immediate need of all kinds of mining material, hemp, and especially steel, cables, which in most Belgian mines were lacking at the time of the German evacuation. Besides this, sorting machinery, motive power, trucks and hoisting machinery of all kinds are needed.

COKE INDUSTRY: Ovens operating by the recuperation process are in especial need of sulphuric acid for the manufacture of sulphate of ammonia for the recuperation of the valuable by-product, benzol, which otherwise would be lost.

AGGLOMERATES AND BRIQUETTES: There is an immediate need for *braie*, bitumen and *goudron*, as binding materials for the making of compressed coal and coke dust, an important fuel in Belgium.

IRON INDUSTRY: The pig iron industry has been kept at the level in Belgium since the armistice by the destruction of 56 out of 60 furnaces during the war, but it is without question that many more would have been lighted had there been an ample supply of mineral which for the most part was received before the war from Lorraine and Briey. Economic and political relations with respect to the interchange of the iron of France and the coal of Belgium have not yet been worked out. It is this, as much as anything, which may be said to have held Belgian pig-iron production down to 4000 tons per month as compared with something over 200,000 tons before the war.

STEEL INDUSTRY: The lack of production of blooms, billets and ingots for rolling into flats and shapes is due entirely to a lack of machinery in all departments, from converters to rolling mills and tube and wire drawers. It is the lack of machinery actually in place that counteracts other influences tending toward the general prosperity of the country.

TEXTILE INDUSTRY: As with the metallurgical industry, both raw materials and shaping machinery are lacking.

GLASS INDUSTRY: This might be revived immediately were it not for a lack of sulphate of soda, being awaited from abroad. The glass industry is one of Belgium's basic industries.

LEATHER INDUSTRY: There is a manifest shortage of hides and skins for current needs and for industrial leather goods, such as transmission belts which were largely produced before the war.

PAPER INDUSTRY: This industry requires 45,000 tons of pulp wood for the year 1919, but above all, sulphate of soda, bleaching lime and other chemicals are needed.

CHEMICAL INDUSTRY: In general, chemicals for industrial use are bound to be lacking for a long time. Belgium needs dyestuffs and the necessary machinery to produce them and other chemicals.

That Belgian industry is making as rapid headway as it is is due entirely to the characteristics and temperaments of the Belgians; that it is not making more rapid headway is due to various temporary conditions.

Some of the great iron and steel plants of Belgium, notably the Cockerill and the Ougree-Marihaye plants, are making progress slowly because the directors prefer to wait and sail under their own colors rather than be in the least tributary to German machine manufacturers who are already making offers to fit up these plants with German machinery, at a price. Even though the price be attractive, considering the low value of the mark, it is not the Belgian spirit to accept assistance from such a source. The metal workers of the Ougree-Marihaye and Cockerill plants which are located at Seraing have stopped work, demanding an 8-hour day and increase in their wages. These are the two large Belgian metal plants.

Arrêté

1. L'exportation hors de Belgique de machines à travailler le métal est interdite. Tout essai d'exporter des machines de ce genre entraînera la confiscation de ces machines.

2. Exception est faite pour les machines qui sont exportées en Allemagne sur l'ordre du Gouvernement Général.

3. Cet arrêté entre aussitôt en vigueur.

Bruxelles, le 17 février 1915.

Le Gouverneur Général en Belgique.
Baron von BISSING,
Colonel General.

Forbidden

1. The exporting from Belgium of metal working machines is prohibited. Any attempt to export machines of this kind will entail confiscation of these machines.

2. Exception is made of machines which are exported to Germany on the order of the governor general.

3. This prohibition will be rigorously enforced.

Brussells, Feb. 17, 1915.
The Governor General of Belgium,
BARON VON BISZING,
Colonel General.

EXPORTATION OF MACHINERY, EXCEPT TO GERMANY, WAS FORBIDDEN BY PROCLAMATION IN BELGIUM

Defend Quality of American Steel

Members of Institute of Mining and Metallurgical Engineers Defend Quality of Domestic Product When it is Reported Americans Will Re-enter German Market—Nearly 1000 Attend Annual Convention

A MERE statement to the effect that a well-known American manufacturer intends to re-enter the German market for high-grade steel, presumably because a product of the desired quality cannot be obtained in this country, precipitated a lively discussion at the conclusion of the session on iron and steel held jointly by the American Institute of Mining and Metallurgical Engineers and the American Electrochemical society at the Congress hotel, Chicago, Tuesday, Sept. 23. A number of metallurgists immediately arose to the defense of domestic steel, stating that it is not necessary for American manufacturers to go into foreign markets to obtain a high quality product.

As stated in the last issue of THE IRON TRADE REVIEW, in which the opening sessions of the Chicago conventions were reviewed, the 120th annual meeting of the American Institute of Mining and Metallurgical Engineers opened Monday, Sept. 22, continuing through the week concurrently with the fifth national exposition of chemical industries and the annual meetings of four other societies. The exposition, briefly mentioned last week, proved to be one of the most comprehensive shows ever held and attracted unusual attention because of its intimate relation to the wartime growth of the chemical and allied industries, which, it is estimated, represent an investment of $1,000,000,000.

Many papers of interest to the manufacturers and consumers of iron and steel were presented in several sessions devoted exclusively to the production of these products. Throughout the technical sessions there was unmistakable evidence of the efforts constantly being made to improve the quality of steel.

Tuesday afternoon at the Congress hotel the institute jointly with the American Electrochemical society held the session on iron and steel which had been scheduled to take place on board the lake steamer returning from Gary. Joseph W. Richards, Lehigh university, South Bethlehem, Pa., presided as chairman. A paper entitled "Blast Furnace Refractories" was read by Raymond M. Howe, Mellon Institute of Industrial Research, Pittsburgh. Mr. Howe emphasized the need for closer study and better co-ordination of effort on the part of the manufacturers and consumers of refractories. He cited several instances where careful sampling of clay increased the refractoriness of the finished product to the extent of 100 degrees Fahr. Proportioning, he said, is a problem that each plant must solve for itself as certain plastic clays bind with flint clays more readily than others. The characteristics of a fire brick depends very largely on the amount of water used in its manufacture. The amount of water to be used in making dense or porous brick varies not only with each individual mix but also with each process of manufacture.

The paper entitled "Effervescing Steel" by Henry D. Hibbard, consulting engineer, Plainfield, N. J., and one entitled "Aircraft Steel," by Alfred Sauveur, Harvard university, Cambridge, Mass., were read by title but were not discussed. J. R. Cain, United States Bureau of Standards, Washington, presented a paper on "Determining Gases in Steel and the Deoxidation of Steel." He claims that despite previous researches, no analytical methods are in use today in steel works for determining the gaseous constituents of steel. He gave a complete resume of the work done on this subject in the past, stated the scope of the investigations now being carried on by the bureau of standards, outlined what is to be accomplished by these investigations and described the results already attained. Mr. Cain's paper provided the basis for a very interesting discussion in which many metallurgists participated. J. S. Unger, Central Research bureau, Pittsburgh, stated that he believes it is more important to study the effect gases have on steel than to identify the gases. When such effects have been found, then the best methods for analysis should be studied. T. D. Yensen, Westinghouse Research Laboratories, Pittsburgh, suggested that a higher degree of accuracy be obtained in gas analysis. He pointed out that an error of one thousand of one per cent makes a vast difference.

A paper entitled "Effect of Time and Low Temperature on Physical Properties of Medium-Carbon Steel," by G. A. Reinhardt and H. L. Cutler, Youngstown Sheet & Tube Co., Youngstown, was read by Walter N. Crafts, British Forgings, Ltd., Toronto, Ont. This paper, which was presented almost in full in the Aug. 7 issue of THE IRON TRADE REVIEW, was widely discussed. The author's statements relating to the seasoning of steel brought forth considerable confirming evidence from those who had had similar experiences.

At the conclusion of the Tuesday session on iron and steel a lively discussion ensued when it was suggested that American manufacturers will have to go to Germany again to obtain quality steel for tools, springs and fine machinery. The statement aroused considerable indignation among the members, who declared emphatically that quality steel now is being made in this country and that through the experimental work conducted at the Carnegie School of Technology in cooperation with the United States bureau of standards, American steel will lead the world.

Bradley Stoughton stated that he recalled the statement made by the chairman of the board of directors of an important manufacturing concern to the effect that his company before the war had bought all of its quality steel in Germany and that now the war is over, it will go to Germany again for that product. C. F. W. Rys, chief metallurgist of the Carnegie Steel Co.; J. A. Mathews, president of the Halcomb Steel Co.; and G. K. Burgess,

chief metallurgist, United States bureau of standards, opposed the statement.

"There is no necessity for this manufacturer or anyone else to go into the German market for steel to be used in any sort of manufacturing in this country," said Mr. Rys. "American steelmakers are putting out steel suitable for the finest instruments and machinery. It is due to the American market to patronize local manufacturers."

The charge that improvements in steel manufacture is not progressing in this country because the Carnegie School of Technology and the United States bureau of mines are working at cross purposes was denied vigorously by Mr. Burgess.

The joint session with the Electrochemical society convened again in the Congress hotel at 8 p. m., Tuesday. Robert W. Hunt, Robert W. Hunt & Co., Chicago, presented a paper entitled "The Manufacture of Steel Rails." Mr. Hunt gave a brief history of the early work pertaining to the manufacture of rails and very carefully outlined a system of inspection adopted by him in 1912 which thoroughly supervises the progressive steps of the manufacture of rails.

The remainder of Mr. Hunt's paper is devoted to the author's ideas regarding certain features of the manufacture of rails and is abstracted elsewhere on this page.

C. L. Huston described the 204-inch plate mill installed in the plant of the Lukens Iron & Steel Co., Coatesville, Pa. Mr. Huston's talk was accompanied by moving pictures, showing the plate mill in operation.

Theodore W. Robinson, Chicago, spoke on the industries of the Chicago district, pointing out that from an unknown fringe of pioneer humanity to the fifth city of the world, is Chicago's achievement in a little more than a generation. He urged the members of the institute to spread the gospel of hard-work, thrift and loyalty. Commenting upon the present unrest, he said: "How vitally necessary is such action is demonstrated by the wide and nationally momentous strike that has been inaugurated against the United States Steel corporation and other interests."

The last iron and steel session, with John A. Mathews, president of the Halcomb Steel Co. presiding, was held at 10 a. m. Wednesday. N. B. Pilling abstracted his paper entitled "Cooling Properties of Technical Quenching Liquids." He stated that the temperature of the liquid bath in which steel is quenched has a decided influence on the speed of cooling in the case of some liquids and very little in the case of others. Widely different physical results have been obtained by the use of water spray, water immersion and oil immersion and further experiment has shown that the quenching effect of water used as a spray or an immersion varies greatly with the temperature of the water. A discussion of the paper was entered into largely by Harrison E. Howe, Washington.

The papers entitled "Differential Crystallization in Cast-Steel Runner," by F. B. Foley, which was published in the July 3 issue of THE IRON TRADE REVIEW; "Oxygen in Cast Iron and its Application," by W. L. Stork; "Deep Etching of Rails and Forgings," by F. M. Waring and K. E. Hofammann; "Graphitization of White Cast Iron upon Annealing," by P. D. Merica and L. J. Gurevich; and "Experimental Data Obtained on Charpy Impact Machine," by F. C. Langenberg, were presented by title only.

The latter paper was discussed at length by Capt. A. G. Zimmermann. It was brought out by Mr. Zimmermann that a method has been developed at the Watertown arsenal whereby the results of an impact test are expressed in pounds per square inch instead of in foot-pounds. He is of the opinion that results expressed in pounds per square inch should be generally adopted.

H. J. French, United States bureau of standards, Washington, next presented an unusually comprehensive paper entitled "Manufacture and Properties of Light-Wall Structural Tubing." He stated that, as far as he knew, no entirely satisfactory method is now in use in America for heat treating long-length pipe. In the discussion which ensued it was stated that long-length pipe was being annealed in electric heat treating furnaces but with this method croppage at one end is necessary.

The final paper presented was entitled "Heat Treatment of Cast Steel," by John H. Hall, Arvid E. Nissen and Knox Taylor, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The paper was verbally abstracted by Mr. Hall and discussed at length by Henry M. Howe, Bedford Mills, N. Y.

Wednesday afternoon's session on pyrometry, which was held in cooperation with the national research council and the United States bureau of standards, referred especially to iron and steel metallurgy.

Notes on Manufacture of Steel Rails

BY ROBERT W. HUNT

AS EACH ingot is a separate and individual casting, I believe that, in addition to the tests representing the whole heat of metal, there should be some way of determining the physical character of the rails rolled from each and every ingot. As a destructive test seems to be the only way to actually ascertain that point, and as, of course, you cannot destroy all the rails, I installed in 1915, what is known as the nick-and-break test, under which a test piece is cut from the top end of the first, or *A*, rail rolled from each ingot. This is nicked and broken, thus enabling the inspector to examine the fractures and, in case of the presence of segregation, pipe, or some other mechanical defect, to reject the rail represented by the test piece. Following such rejection, a test piece shall be cut from the bottom end of the same rail and broken; if that piece has similar defects, the second, or *B*, rail is rejected, and a piece cut from its lower end, and tested. In case of failure, the procedure is continued for the succeeding rails until a sound one has been reached. This has proved an expeditious and cheap procedure.

As the chemical composition of the steel is a fundamental part of rail specifications, a very important point is the taking, for analysis, of the drilling representing the heats of steel from which the rails are rolled. The drillings must be taken from test ingots, and the time and manner of casting these ingots, as well as their shape, is receiving attention. In fact, the whole matter of ladle-test ingots is now receiving the attention and study of a committee of the American Society for Testing Materials in conjunction with the United States bureau of standards. Pending a full report on the subject by them, it would appear desirable to require the adoption of a standard sized and shaped ladle-test ingot and to insist that it be cast as sound as possible by the addition of aluminum to the

From a paper presented at the annual meeting of the American Institute of Mining and Metallurgical Engineers.

molten steel; further, that two or three should be cast at equal intervals in a heat during the pouring of the large ingots and drillings from them carefully mixed. Thus, greater protection would be afforded as against a single small test ingot not representing, thoroughly, say, a 100-ton heat of steel.

Another point of less importance, but still of prime necessity, is the milling of both ends of the rails. This has been the practice of English mills for years and some American makers mill one end of some of the rails made by them. Depending on chipping and filing for the finishing of the ends of the rails is very unsatisfactory. Milling would not only eliminate all fins resulting from the hot sawing, but positively assure squareness of ends and accuracy of lengths, all three of which are of great importance in relation to joints, a part of track maintenance that is receiving more and more attention.

Much thought and considerable experiment have been given to the betterment of the cold straightening of rails. From the time of that procedure being represented by the blows of a heavy sledge swung by a sturdy man, the practice has been a brutal one. To accomplish the semblance of the desired result, the steel has to be bent beyond its elastic limit, thus establishing strains with an ever present danger of causing actual or incipient ruptures in the metal, which may result in complete rail failures. In my judgment, it is practical to do away with cold straightening, by proper hot straightening of the rails. If, in case of uncontrollable conditions, a few rails should come from the hot beds unsuitable for use, they could, after some straightening, be classed as seconds and used for other than main track purposes.

In the present practice, a rail is put under the cold press and most carefully, but brutally, punched into seeming straight line and surface. Frequently, it is later put on the ties and with equal care spiked out of a straight line into curves of varying degrees. Rails can be hot straightened without any short kinks and with lines that will permit good loading for transportation and satisfactory track laying; thus can the expense and danger of the cold straightening be avoided. There are now at least a thousand tons of rails, finished as above advocated, giving satisfactory service in the lines of several railroads having heavy traffic, and they have had over three years of trial. The rail makers will welcome such a departure from present practice and, I am confident, make it successful.

To secure sound rails it is of supreme importance to make sound ingots. Sir Robert Hadfield, in October, 1912, presented a paper before the Iron and Steel institute which attracted wide attention and much discussion. The plan is broadly designated as using a "hot-top ingot," and many plans of obtaining such castings, other than directly following Sir Robert's, have been and are being successfully employed, notably, on ingots to be used in ordnance work. As yet hot-top ingots are not used in rail making; both encouraging and disappointing experiments have been made, but I am satisfied that it is practical and will be so proved. Based on the results obtained with other than rail ingots, its success with them is bound to come. Therefore, while I am not at this time prepared to incorporate hot-top ingots in rail specifications, the time is near when it will be entirely practical to do so. It may involve a somewhat greater first cost, to be at least partly offset by saving in scrap, but if the outlay is justified when making steel to be used in destroying life, should it not be even more so when producing metal on the soundness of which human safety will so largely depend?

Avoiding Brittleness

The most harmful physical characteristic of rail steel is, of course, brittleness. The low amount of phosphorus present in open-hearth steel renders protection against the dangers from that element and permits freer use of carbon as a hardening element. Experience has pretty well demonstrated that the safe upper limit for carbon in rail steel is approximately 0.75 per cent; and accepted practice has allowed a working range of 13 points, with the result that the lower limit of carbon has been most frequently specified as 0.59 per cent, but in some cases 0.62 or 0.63 per cent; speaking, of course, of the almost universally accepted practice of having the steel contain not over 0.04 per cent phosphorus. The problem of always making basic open-hearth steel within this range is difficult and frequently heats are cast slightly outside the limits specified. There is a much greater commercial opportunity for manufacturers to find other than rail uses for steel containing the lower amounts of carbon than when containing the higher amounts; therefore, they naturally aim to have the carbon content nearer the low side of the permitted range. Hence, the larger percentage of heats is on the low side of the allowed carbon. In repeated cases, "off heats" are produced which fail to be within the prescribed limits of the particular specification to which the rails are being rolled, but are entirely applicable to another rail specification for which the mill has orders. This leads to the ingots from such heats being temporarily discarded, later to be reheated and rolled on the other specification. This means reheating and rolling of cold ingots, which is invariably accompanied by an increased production of second-quality rails, largely augmented by the lack of proper control and treatment in the soaking pits.

The various railway systems of the country are now using as their standard practice about the same weight of rails. There are some variations of sections, but I do not see any serious objection to the adoption of a general or common chemical specification. We know that hundreths of percentages are very delicate variations and, especially in relation to carbon, errors may occur in the results obtained by two different chemists, particularly if working under modern manufacturing pressure. If a common carbon, silicon, manganese, and phosphorus specification prevailed, the work of the open-hearth steel melter would be simplified, the cold-ingot trouble eliminated, and, I think, better general results obtained.

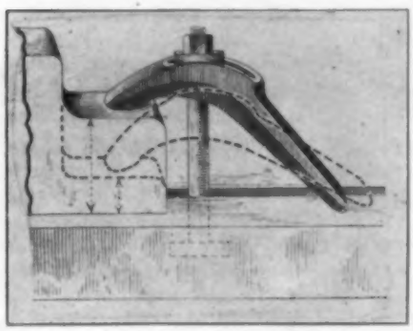
As a means of lessening the tendency on the part of the manufacturers to protect themselves by keeping the carbon content of the metal toward the lower range, it would be well to accept not over an agreed upon small per cent of heats slightly higher in carbon than the specifications. These rails could be specially marked and shipped, so that the roads would have them by themselves and use them in places for which they would be well adapted. I think that there would be but a very small percentage of such rails produced, but the very fact that the danger of rejection from over high carbon would be eliminated would cause the steel makers to feel less restricted in their procedure. In other words, it would allow a certain elasticity which would, undoubtedly, work to the advantage of both producers and consumers; of coure, for acceptance, the high-carbon steel must have successfully passed the prescribed physical tests.

Another development of great interest is the triplex processes, both on the bessemer open-hearth electric and the bessemer and double open-hearth plans. These are being worked out in practice and, I believe, will soon be adding much toward the production of more regular and, hence, better steel and better rails.

Machine Clamp Eliminates Tool Blocks

A clamp for firmly holding work on planers, boring mills, drill presses, face plates of lathes, milling machines and for holding down press bolsters and fixtures was brought out recently by Albert O. Mathison, New Britain, Conn. It may be used on the side of the work, leaving the top surface free for machining or it may be used as an inexpensive planer vise.

If the work is out of square or tapered, the clamp will adjust itself to all angles. When the clamp is used on the side of the work, as shown in the accompanying illustration, a cut equal to the capacity of the machine may be taken without the work slipping, it is said. The clamp is 8 inches long, 1½ inches thick and is equipped with a ¾-inch slot. The clamp, which is drop forged and hardened, weighs 3½ pounds.



THIS CLAMP MAY BE USED IN MANY DIFFERENT POSITIONS

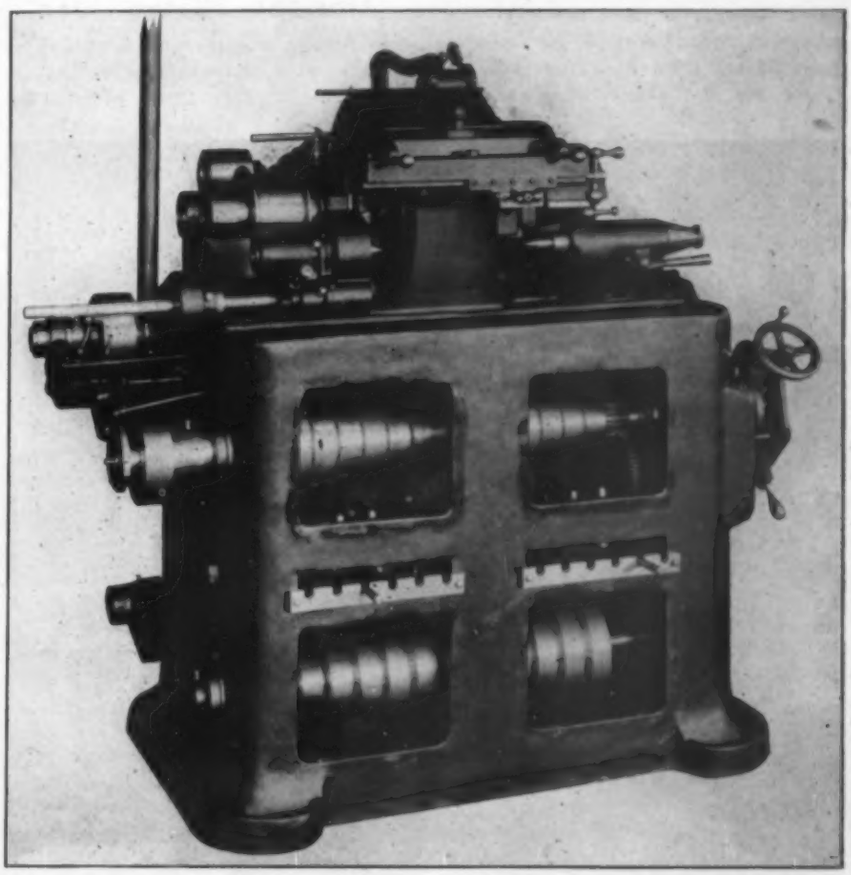
New Grinding Machine is Semiautomatic

A new semiautomatic wide-wheel grinding machine recently was designed by the Woods Engineering Co., Alliance, O. The work has a straight in and a straight out movement with a slight movement lengthwise during the grinding period.

The machine, which weighs 6000 pounds and occupies a floor space of 6 x 6 feet, has a grinding wheel of 8 inches face and 20 inches maximum diameter. Work 15 inches long and 10 inches in diameter can be handled between the centers. The head and tail stocks are mounted on a square shaft having clamped to it an arm which carries the mechanism for making the diameter adjustments in grinding. This arm is shown at the right side of the machine in the accompanying illustration. A shaft running through the housing parallel to the square shaft carries on the right-hand end a cam that controls the movement of the work to the grinding wheel. This cam shaft has six speeds.

At the left-hand end of the cam shaft is a cam that controls the clutch pulley driving the work. These two cams are timed so that as the work moves up to the grinding wheel, the clutch pulley is engaged and the work starts rotating just before it makes contact with the grinding wheel. When the grinding cycle is completed, the work moves away from the wheel, and stops rotating to be reloaded. The grinding wheel head swivels on a stud for grinding taper work.

For truing the grinding wheel a frame is pivoted on the casting which forms the wheel guard. This frame carries a dovetail slide arranged to a swivel and a carriage with a cross feed movement carries the diamond holders. In operation the work centers are lowered by removing the hardened pin that bears on the cam, swinging the truing frame down to a positive stop and bringing the diamond on the same plane as the work contact. The machine is entirely self contained even to being equipped with a crane for handling the spindle when changing wheels.



THIS MACHINE REQUIRES ONLY LOADING AND UNLOADING. GRINDING IS AUTOMATIC

Training Foremen to Lead

(*Continued from Page* 895)

pathetic attitude toward workmen, saying:

"The workman demands more liberty in industry, a share in the policies of management so far as they touch his interests. In so doing he rarely adopts any one of the schemes of social reconstruction which are pressed upon his attention today, nor does he mean to dispense with or overrule the superior ability, knowledge and experience admittedly necessary in the general conduct of a plant by its managers and owners. There are schemes which propose to lay violent hands on all capital with no adequate care for skilled direction, but the workman's desire is for a change in the spirit of industry, and that change is being welcomed by all thoughtful owners and executives."

He says the question of what labor wants was studied in all the classes of foremen with which he was identified, and it was concluded that a workman will be contented as a rule if he obtains:

Security of employment, a voice in fixing employment conditions, a fair share of the profits, working hours yielding reasonable leisure, prevention of profiteering, suitable housing and welfare provision, economic instruction and opportunity to rise. The

contented workman will co-operate if there is: Elimination of all suspicion of his employer, creation of confidence between him and executives, recognition of mutual interests in industry, creation of machinery for facilitating acquaintance and an absence of all paternalism in industrial relations.

Bucket Has Working Parts Completely Enclosed

The Wellman-Seaver-Morgan Co., Cleveland, has developed a clam-shell bucket which has all the working parts completely enclosed in a tight casing where they are constantly lubricated and where they do not come in contact with the material the bucket is handling. The bucket is composed of a comparatively small number of parts, so arranged as to facilitate the removal of any part in case of necessary repairs. This bucket is especially designed for handling coal, sand, gravel and cinders. It is operated by two ropes and, consequently, can be handled by practically any type of two-drum hoist.

The bucket has enclosed gearing to produce the necessary digging power. The power casing, which forms the main frame of the bucket, and from which the shells are suspended, is divided in a vertical plane through its longitudinal center-line. These two sections are bolted together to form two tight compartments, which enclose the operating gears, and a third compartment in the center for the power wheel and the deflecting sheaves for the operating ropes.

The power-wheel center is integral with the two bevel pinions which extend into the gear compartments and mesh with the operating segments. These segments are keyed to the operating shafts which are supported in bearings cast in the casings. The outer end of the operating shafts are finished square and support the rear bucket arms which are connected to the shell shafts. The cutting edges of the shells are pin connected to the side bars. The latter are suspended from lugs cast in the top part of the casing.

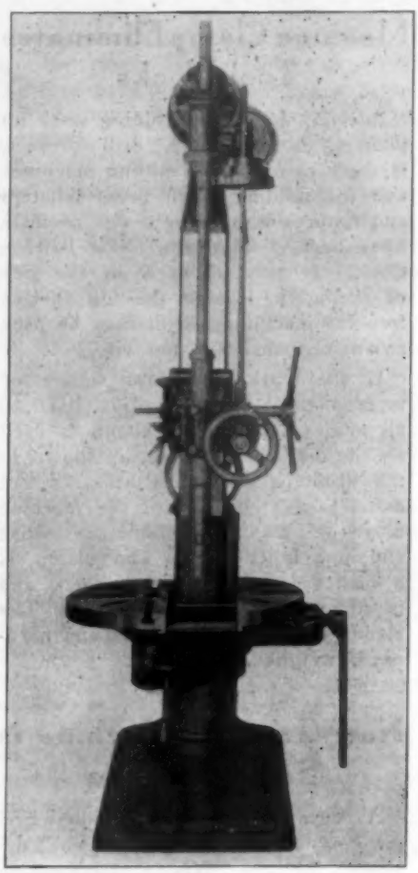
The shells are open at the back to prevent compression of the material when the bucket is closing. The rigid connection of the rear arms to the operating shafts and to the shell shafts insures positive alignment of the shells; and side lash is further prevented by side-bar guides attached to the shells. As the operating gears are completely enclosed by the casing, it is impossible for them to come in contact with the material being handled.

The opening of the bucket is effected by an opening rope attached to the small section of the power wheel, and wound in the opposite direction from the closing rope.

CLAM-SHELL BUCKET BUILT WITH ENCLOSED GEARING WHICH OPERATES IN OIL

Designs Platen Vise

In drilling and reaming a number of machine parts, means for clamping the work on the drill press platen must frequently be provided. This procedure involves hunting up bolts and straps to say nothing of the time consumed in locating the pieces in position for the machining operation. The device shown in the accompanying illustration recently was designed by the Sprague-Hayes Mfg. Co., Detroit, to furnish a ready means for holding work on the drill press for drilling and reaming.



THIS DRILL PRESS PLATEN IS EQUIPPED WITH JAWS FOR LOCATING THE WORK TO BE MACHINED

The device in general design resembles a milling machine vise with the difference that the top is circular and finished like a drill press platen. The back jaw is stationary while the front jaw is actuated by means of a substantial square-threaded screw. The jaws that hold the work are case hardened to protect them from undue wear and finished by grinding to insure accuracy. Special jaws for holding odd-shaped pieces can readily be substituted for the plain jaws as in ordinary milling machine practice.

As the device can be rotated on its center and swung in an arc under the drill press spindle, the work is readily centered after the method used in ordinary drill press practice. When the jaws are closed together the device forms an ordinary drill press platen and work can be clamped to it in the usual way if desired.

Exhibits Show Year's Progress

Foundry and Machine Exhibition Replete With Working Displays of New Devices Designed to Meet Labor Shortage and Reduce Costs—Foreign Equipment Exhibited — Molding-Machine Displays Complete

THAT the strain of high pressure production, felt by the manufacturers of the United States while making their unprecedented and successful attempt to meet the demands of war, did not retard to any appreciable extent their desire or ability to create new and better machine shop and foundry equipment was amply demonstrated at the fourteenth annual exhibition of the American Foundrymen's association, which opened Monday, Sept. 29 at the Philadelphia Commercial Museum. Proof that engineers have taken full advantage of the cessation of hostilities to engage in experimental work and to further develop labor-saving machines, was provided in many of the exhibits of molding machines, sand-blasting equipment, and metal and wood-working machinery.

The association was particularly fortunate this year in securing a hall in which all of the exhibits could be assembled in one room. This feature more than compensated for the slight inconvenience involved in reaching the exhibition from the hotel where the meetings were held.

One of the most noteworthy machines displayed by the manufacturers of molding equipment was a device for producing tractor transmission housings in green sand designed and patented by J. T. Stoney, foundry superintendent of the Ferro Foundry & Machine Co., Cleveland. A detailed account of the manner in which this equipment is operated appeared in the Sept. 18 issue of THE IRON TRADE REVIEW. Other new equipment included a combination split-pattern machine display by the Mumford Molding Machine Co., a jarring stripping-plate machine exhibited by the Tabor Mfg. Co., and a machine of the jar-ram type shown by the Cleveland-Osborn Mfg. Co., Cleveland.

The exhibit of Henry E. Pridmore, Chicago, included seven molding machines ranging in size from a 10 x 12-inch stand machine to a 36 x 48-inch electric jolt-stripping machine.

An unusually complete line of molding machines was displayed by the Tabor Mfg. Co., Philadelphia. Molds for a large tractor motor crank-case were made on a 9-inch jar roll-over pattern-drawing machine.

The exhibit of the Federal Foundry Supply Co., Cleveland, in addition to the machine made by the Ferro Foundry & Machine Co., previously mentioned, included portable and stationary combination jar and squeezing machines, plain squeezers, air and electrically operated vibrators, snap flasks, and an agricultural tractor driven by a 2½-horsepower engine.

The Champion Foundry & Machine

At Work Today

IN THE midst of today's upheavals, it is becoming constantly more patent that the crying need of the hour is increased production of commodities of every kind and the orderly and just distribution of those commodities so they may serve the convenience and comfort of mankind. From this imperative task the workers of the world are temporarily turning away. But one great body of men—the engineers, inventors, designers and constructors of labor-saving equipment—are bending more rigorously to their tasks than even during the war. Their efforts stand forth in refreshing contrast. This is evident from even a cursory survey of the great interallied foundry and machine exhibition in progress in Philadelphia this week. On every hand are new devices and equipment designed to lessen manual effort, speed-up production and cut costs. Who may say but that herein lies potent aid in our present distress?

TWO DAYS BEFORE THE HOUR SET FOR OPENING, THE 1919 FOUNDRY AND MACHINE EXHIBITION WAS NEARLY COMPLETE

Co., Chicago, demonstrated a 16-inch jolt roll-over machine fitted with a pattern and operated as a molding machine and a similar machine fitted with a core box and operated as a core-making machine. A new jolt-squeezer type machine in which an internal cylinder performs the jolt and a 12-inch cylinder causes the squeezing was demonstrated by the Berkshire Mfg. Co. Cleveland.

The E. J. Woodison Co., Detroit, had an extensive display of molding machines. The Mumford Molding Machine Co., Chicago, exhibited a new combination jolt split-pattern molding machine equipped with a

THE SHOW THIS YEAR IS UNUSUALLY REPLETE WITH MACHINERY AND MACHINE-TOOL EXHIBITS DISPLAYED UNDER WORKING CONDITIONS

automatic slow starting pattern-draft cylinder operated by oil and controlled by a knee valve. The Herman Pneumatic Machine Co., Pittsburgh, displayed a plain jarring machine with the table plate off of base to show the construction of the machine. A new jolt roll-over machine and a small hand roll-over machine were shown by the Grimes Molding Machine Co., Detroit. The Davenport Machine & Foundry Co., Davenport, Iowa, exhibited a combination jolt roll-over pattern-drawing machine, a 30 x 30-inch jolt stripper and a jolt squeezer.

The Arcade Mfg. Co., Freeport, Ill., exhibited a plain air operated squeezer, a combined jolt and squeezer, other molding machines of hand and air operated types, four core-making machines, and a pouring device. Various types of molding machines also were displayed and operated by the Buch Foundry Equipment Co., York, Pa.; the International Molding Machine Co., Chicago; and the United States Molding Machine Co., Cleveland.

The Foundry Appliance Co., Newark, N. J., demonstrated a cope handling device on a squeezer type molding machine. As the piston moves upward the cope is clamped against the head of the machine by flask hooks. On the down stroke of the piston, the pattern is drawn from the cope and drag. The plate is removed and the mold closed by lowering the cope on the drag. Taper snap molding flasks and automatic snap flasks were demonstrated on a power squeezer machine by the T. B. Wood's Sons Co., Chambersburg, Pa.

Machine Tool Exhibits Set Record

In number of tools displayed and in the diversity of work actually performed during the week, this year's exhibition of metal and woodworking machinery surpassed any previous foundry show and undoubtedly equaled any exposition of its kind ever held in this country. The effort of engineers to design equipment calculated to conserve manpower was reflected more noticeably in the display of machine tools than in the exhibits of any other branch of industry represented. The tendency to equip machines with direct or gear connected motor drive was never more strongly emphasized and the growing popularity of remote control for electric motors was apparent.

The products of seven machine tool manufacturers were displayed and demonstrated in the spacious booth of the Vandyck-Churchill Co., Philadelphia. Among the metalworking tools shown in this exhibit are those of the American Tool Works Co., Cincinnati. An 18-spindle multiple drill made by Edwin Harrington Son & Co., also was demonstrated in this booth and screw chains manufactured by the same company were displayed.

A milling machine manufactured by the Kempsmith Mfg. Co., Milwaukee, was demonstrated in the Vandyck-Churchill booth, two 8-inch stellite cutters with 1⅛-inch face working on a high carbon steel casting.

Machines representing seven different manufacturers were shown by the Monarch Machinery Co., Philadelphia. Among the tools exhibited were a heavy-duty 3-inch drill made by the Minster Machine Co., Minster, O.; a 26-inch drill press manufactured by the Weigel Machine Tool Co., Peru, Ind.; a plain milling machine built by the Rockford Milling Machine Co., Rockford, Ill.; a manufacturing miller, the product of Gooley & Edlund, Inc., Cortland, N. Y.; a 32-inch shaper made by the Cincinnati Shaper Co., Cincinnati; a 2-spindle sensitive drill manufactured by the Edlund Corp.,

SOME OF THE EXHIBITS OF FOUNDRY SUPPLIES, METALS AND MACHINE TOOLS

Cortland, N. Y.; a geared-head lathe made by the Monarch Machinery Co., Sydney, O.; a 14-inch tool room lathe and a 10-inch manufacturing lathe, the products of the Rockford Tool Co., Rockford, Ill.; a 9-inch lathe made by the Dalton Machine Co., Inc., New York; and a cutter and reamer grinder, a surface grinder and a drill grinder made by the Wilmarth & Mormon Co., Grand Rapids, Mich. Machine tools made by four manufacturers comprised the exhibit of the Swind Machinery Co., Philadelphia.

Albert Herbert, Ltd., New York, and Coventry, Eng., demonstrated a British-made combination turret lathe working on 3-step cone pulley castings; a hexagon turret lathe operating on a 3-diameter bolt; a grinder working on high speed steel lathe, planer and shaper tools, finishing them from bar stock without forging; and concentric chucks.

The Heald Machine Co., Worcester, Mass., exhibited two internal grinders, one of which has never been displayed before; an 8-inch rotary surface grinder; a cylinder grinder; and magnetic chucks. The Bullard Machine Tool Co., Bridgeport, Conn., showed a multiple milling machine with six heads operating on bevel gear blanks. The Cincinnati Pulley Machinery Co., Cincinnati, demonstrated sensitive drills and drills with built-in tapping attachments.

The exhibits of wood and pattern-making machinery were unusually complete. The American Wood Working Machinery Co., Rochester, N. Y., displayed a 16-inch motor driven jointer, a 36-inch band saw, and combination disk and spindle sanding machine, a motor driven 4-inch bench planer and a single surfacer. Charles H. Besley & Co., Chicago, exhibited two metal working grinders, a patternmakers combination grinder, a 30-inch ringed wheel grinder, two disk grinders and abrasive disks. The Gardner Machine Co., Beloit, Wis., and others, showed a variety of equipment.

Pointers on Plant Design

In times past any sort of structure has been deemed entirely suitable for a foundry, but the handicap of poorly designed buildings and equipment is now generally recognized. This change of viewpoint, marking as it does the passing of another phase of hit-or-miss manufacturing methods, is emphasized by the growing class of construction engineers who design buildings for exclusive foundry purposes. The Philadelphia show was featured by a number of interesting exhibits by this class of experts. Frank D. Chase, Inc., Chicago, showed a large number of photographs accompanied by descriptive matter covering foundry construction of a modern character. The Clement A. Hardy Co., Chicago, presented some exceedingly interesting photographs of foundries constructed or now being built in various parts of the country. The Austin Co., Cleveland, had a number of models, drawings and photographs accompanied by literature covering the class of service which this concern has given and offers in the special field of foundry erection. The H. M. Lane Co., Detroit, also offered examples of this class of work.

Construction problems immediately suggest a thousand details of arrangement and handling facilities, without which the most perfectly designed plant would be inefficient. Handling materials in casting plants is a specialized field and as such is recognized by a number of representative manufacturers who build to meet the needs of the times. Obviously it was impracticable to show full size cranes with craneways proportionate to modern foundry needs, but the crane and hoist manufacturers utilized novel expedients to exhibit their products

AN UNUSUALLY COMPLETE DISPLAY OF CLEANING-ROOM EQUIPMENT WAS SHOWN BY THE PANGBORN CORP.

to the best advantage. The **Shepard** Electric Crane & Hoist Co., Montour Falls, N. Y., showed a special abbreviated structure upon which was mounted a standard crane trolley operated by controllers placed on the floor nearby. The same frame served to support a cage-operated hoist with electric magnet, two standard types of floor operated hoists, and a new type of electric cargo winch. The latter consists of a case base upon which is mounted a back-geared motor with a special drum and winch head. The head is arranged so that a load may be held stationary while the boom is raised, lowered or swung around independently by motor power.

Exhibits a Full Sized Section

The Cheseapeake Iron Works, Baltimore, exhibited a section of a full sized craneway supported upon an exceptionally well built steel frame which demonstrates the character of other steel structures which this company constructs. Photographs served to set forth the variety of this latter class of work. The Whiting Foundry Equipment Co., Harvey, Ill., featured an operating model of a crane trolley in addition to a diversified list of foundry equipment which included a round steel plate tumbling barrel, a 2-ton charging car, a 2-ton worm geared crane ladle and photographs and drawings of the application of machinery which is in successful use.

The pneumatic hoist manufacturers were liberally represented. The Chicago Pneumatic Tool Co., Chicago, exhibited pneumatic geared and cylinder hoists in addition to its line of chipping and riveting hammers, drills, grinders, rammers, and a 14 x 9 x 14-inch air compressor. The Ingersoll-Rand Co., New York, had on exhibition motor hoists, grinders, rammers, and chipping and riveting hammers. The Curtis Pneumatic Machinery Co., St. Louis, had in operation an overhead pneumatic crane with an air-hoist, an electrically driven air-compressor, a bracketed jib crane and an I-beam trolley crane.

The Cleveland Pneumatic Tool Co., Cleveland, George Oldham & Sons Co., Frankford, Philadelphia, and the Keller Pneumatic Tool Co., Chicago, all had interesting displays of pneumatic tools which have come to be indispensable in the foundry. The Keller company showed an attractive novelty in a model of a large riveting hammer, mounted with cut-out sections and moving to indicate the operation of the tool.

Comfort was a minor consideration, often entirely ignored in the old-time foundry. Molders were expected to be warm only when pouring off, and daylight was admitted sparingly and mixed with the wintry blasts through haphazard windows. Times have changed. Foundry heating units are much in evidence, and manufacturers have successfully divorced light from cold by providing steel frame sashes which can withstand the rigors of foundry usage. Robert Gordon, Inc., Chicago, showed a mechanical hot-blast heater provided with a sectional case which through numerous sliding doors permitted an inspection of the interior. Skinner Brothers Mfg. Co., St. Louis, showed a heater in which a motor driven fan sucks air through an outside intake and blows it through heating coils and out into the foundry.

The Sterling Wheelbarrow Co. featured its exhibit of metal flasks and wheelbarrows by some especially large special forms of flasks with intricate bars.

The displacement of human labor was typified in the various displays of foundry hauling units. The Mercury Mfg. Co., Chicago, showed a 3-wheel and a 4-wheel unit of its storage battery type tractor and two Bateman trailers. The tractors gave practical demonstrations during the erection of the various exhibits by hauling the heavy machinery into place about the floor of the exhibition hall. The Liberty Steel Products Co., New York, had two types of gasoline-driven industrial tractors and two lift trucks on exhibition, while the Cleveland Tractor Co., Cleveland, had one of the crawl type gasoline motor units in its booth.

Producers of foundry raw materials were plentifully represented. A most attractive minature model of a blast furnace was displayed by the Thomas Iron Co., Hokendauqua, Pa. The Semet-Solvay Co., Syracuse, N. Y., with Pickands, Brown & Co., Chicago, constructed a model of Independence hall, using coke for the building material. Rogers, Brown & Co., Cincinnati, showed samples of coke, alloys, pig iron and fluor spar together with finished castings. The 12-cylinder Liberty motor which was constructed as a permanent exhibit at the Smithsonian institute, Washington, was also displayed by this company.

Manufacturers of miscellaneous foundry supplies were more in evidence at this than at any previous show. Core compounds and the work produced by their use were shown by the American Gum Products Co., New York; Corn Products Refining Co., New York; the Robeson Process Co., New York; Werner G. Smith, Co., Cleveland; the Barrett Co., Chicago; Swan & Finch, New York; American Oil & Supply Co., Newark, N. J.; the Mifflin Chemical Corp., Philadelphia; and Spencer Kellog & Sons, Inc., Buffalo.

Welding and cutting apparatus has shown great advance during the past year under stress of reconstruction demand. An oxyacetylene installation for cutting stock up to 12 inches thick and oxyhydrogen apparatus for cutting even 36 inches of metal were shown by prominent manufacturers. Electric welding apparatus also was displayed.

Wood block floor which has found favor in the past few years for castings plants was demonstrated by the Republic Creosoting Co., Indianapolis, and Jennison-Wright Co., Toledo, O.

Varied Furnace Displays

Manufacturers of furnaces displayed different kinds of melting equipment and a number of concerns which did not show products had representatives on hand to explain the design and operation of their equipment. An assortment of nonferrous melting furnaces were shown by the Monarch Engineering & Mfg. Co., Baltimore. Four types of noncrucible furnaces including a double-chamber furnace, a vertical furnace and a rotary furnace were shown besides a tilting coke-fired furnace with crucible, a tilting oil-fired furnace with crucible, three oil, gas and coke-fired core ovens, a stationary oil or gas-fired steel melting furnace and a ladle heater.

The Hausfeld Co., Harrison, O., also showed variety of furnaces, including both crucible and noncrucible types. Their exhibit included a noncrucible furnace of the tilting type, a tilting crucible furnace, a stationary crucible furnace, an aluminum melting furnace using a cast-iron melting pot, a ladle heater and other foundry equipment for nonferrous metal.

A 60-kilowatt Ajax-Wyatt electric furnace was among the exhibits of the Ajax Metal Co., Philadelphia. This furnace was not operated. This firm also had a display of yellow brass ingots which were made in the Ajax-Wyatt furnace. These ingots have depressions on each side which allow tongues to grip them firmly. A series of ingots made from different formulas and a variety of castings made from similar ingots were displayed. Among the castings were some water-back bearings and pump casings for motor-driven fire apparatus, both of which castings have thin wall sections. The Industrial Electric Furnace Co., Chicago, showed a recently developed process of preheating the charge before placing it in the electric furnace was displayed and details were fur-

nished covering the method of handling the charge before it is placed in the electric furnace.

Among the burners which attracted attention was an extra large one exhibited by the Hauck Mfg. Co., Brooklyn, N. Y. This burner, which has a nozzle 20 inches long, throws a flame 12 inches in diameter a distance of 20 feet. The length of the flame was illustrated by streamers blown by air, giving a slight idea of the size of the flame. This company also displayed burners for thawing frozen sand, coal or coke from cars or bins. These burners are new and have not been exhibited previously.

The Combustion Economy Corp., Chicago, exhibited a new design of pulverized coal feeding and burning equipment. This is provided with an air-tight rotary air gate, a variable speed direct connected gear case with speeds marked to conform to the operation of the air gate, and a powdered coal carburetor.

The Leeds & Northrup Co., and the Brown Instrument Co., both of Philadelphia, showed a number of recording and indicating pyrometers. The recently developed heatmeter using the Harrison-Foote method of compensation was shown by the Brown company. This instrument compensates for any variation in the line or thermocouple up to 15 ohms, which is ample to take care of any variation ordinarily met with.

A large section of the exhibition space was taken up by the Pangborn Corp., Hagerstown, Md., with a comprehensive display of sand blast equipment. At one end was a 90-inch rotary table cabinet for cleaning large castings. With this machine the operator stands on the outside of the sand-blast room and avoids the dust while cleaning castings. A 20-inch revolving table for taking care of smaller castings was in operation. Cabinet sand-blast apparatus and an abrasive separator for cleaning sand or other abrasives were shown, together with several other devices.

The J. W. Paxson Co., Philadelphia, had an exhibit of sand-blast apparatus including three separators and dust collectors and two kinds of barrels. This company also had installed a 54-inch cupola and displayed many of the other products handled by it, including foundry facings, sands, gravels and clays. The W. W. Sly Mfg. Co., Cleveland, showed a sand-blast mill and a turntable cabinet complete with sand and dust separating system.

A late type of cloth-screen dust arrester was shown by the Mott Sand Blast Co., New York. The Macleod Co., Cincinnati, exhibited two sand-blast barrels, a sand-blast hose machine and a portable oil burner. A 32-inch diameter, revolving barrel sand-blast machine and a 66-inch diameter sand-blast table were in operation at the exhibit of the Hoevel Mfg. Corp., Jersey City, N. J.

The American Foundry Equipment Co., New York, displayed the auto sand cutter.

Wm. Sellers & Co., one of Philadelphia's oldest manufacturers, exhibited two tool grinders, a drill grinding machine and a sand mixer, all operated by direct current. This company also had a sand mixer arranged for alternating current. This arrangement gives a variable speed such as cannot usually be obtained from alternating current.

EXHIBITS OF SAWS AND MISCELLANEOUS METAL WORKING EQUIPMENT

The Link Belt Co., Chicago, displayed a silent chain drive also an operating electric hoist of 1-ton capacity. It also exhibited a conveyor belt idler and a Rapp sand revivifier.

Working models of tractor, crane and screen types of sand cutting machines built by Wadsworth & Co., Cleveland, were shown. A most complete display of sand mixing machines of the Simpson-Muller type, varying from 3 to 6 feet in diameter were exhibited by the National Engineering Co., Chicago. The 6-foot machine was operated during the show.

An electrically operated sand sifter and a gas unit for cutting iron and steel by the use of artificial or natural gas was shown by the Vibrating Machinery Co., Chicago. A motor driven sand mixer was shown by the Standard Sand & Machine Co., Cleveland.

Brass tumbling mills, power and hand sprue cutters, core ovens, both gas and coke fired and brass furnaces for both coke and coal, characterized the extensive exhibit of the S. Obermayer Co., Chicago. Cherry and oak snap flasks with iron jackets also were exhibited.

To Build Furnaces

Organized with a paid-up capital of $1,000,000, the Booth Electric Furnace Co., Chicago, recently was incorporated and has acquired the patents, assets and good will of the Booth-Hall Co., electric steel and brass melting furnace manufacturer. The scope of operations of the old company will be enlarged.

The Booth rotating furnace, designed for melting nonferrous metals has been standardized and in the future will be built in four units, 250, 500, 1000 and 2000-pound capacities. The 2-phase, 2-electrode Booth-Hall furnace for melting iron and steel, will be made in five sizes, namely, ¾-ton, 1½-ton, 3-ton, 6-ton and 12-ton. An improved type of furnace, oval in shape, has been developed.

Officers of the new corporation are: President, L. E. Myers, president of the L. E. Myers Co., Chicago; vice president, C. H. Booth, former president of the Booth-Hall Co., Chicago; secretary, W. K. Booth, former chief engineer of the Booth-Hall Co. and treasurer, L. J. Clark, of the L. E. Myers Co. In addition to these men the board of directors includes Martin J. Insull, vice president of the Middle West Utilities Co., and E. W. Lloyd, of the Commonwealth Edison Co., Chicago.

Modern Industry

Should Rule in Weighing Dissolution Suit, Says Steel Corporation

That the court's decision of the government's suit to dissolve the United States Steel Corp. be rendered under the Sherman act in the light of the facts concerning the steel industry growing out of the war and not on the condition of the industry 20 years ago, is asked in a supplemental brief filed several days ago in the United States Supreme Court by the corporation. The suit, which has lain dormant while the war was in progress as no steps were taken to bring it to an issue, now stands sixth on the court's docket and will probably be up for hearing the latter part of October. At that time a final determination of the case is expected.

In its brief the corporation points out that in 1901 it produced but 50.1 per cent of the steel output of the country and that in 1911 this figure had dropped to 45.7 per cent, showing that it does not have preponderance in sense of power to control the industry. It further deals with the fact that although the case had lain dormant during the war, the corporation expended enormous sums in enlarging its various plants, which enabled it to meet the requirements of the government during the war. It points out that when the war broke out, it pressed for a speedy determination of the government's appeal on the ground, that the government's probable steel requirements would necessitate the erection of these plant additions, and the employment of a vast amount of additional capital, which would result in great loss and embarrassment to the corporation and its stockholders if the suit was decided against it. At that time, the government successfully resisted the appeal upon the ground that it was not in the interest of the public to have the case decided during the period of the war.

The brief further asks if any one can doubt that the corporation's ability to meet the government demands during the war was due to its size and strength, regarding which the government complained of "concentrated economic power," and further inquires if this power should be ruthlessly destroyed on the mere theory that it may possibly be abused.

Vote For 10-Hour Day

Employes of the Carpenter Steel Co., Reading, Pa., on Sept. 26 voted for a 10-hour day as a substitute for the 8-hour day. Out of 1450 employes of the company entitled to vote, 1206 voted and 840 declared themselves in favor of the 10-hour day, 165 in favor of eight hours, while 85 voted both ways. The 10-hour day means extra pay, if adopted.

Electric Steel

Discussed at Meeting of Electric Furnace Association in Chicago

More than 60 of the foremost electric steel men of the United States and Canada, attended the meeting of the Electric Furnace association, held at the Congress hotel, Chicago, Sept. 22. At the meeting an interesting paper was read by H. G. Weidenthal, in which the great demand for better steel in the automotive industry and the increased demand for electric steel in that field was pointed out. Mr. Weidenthal recited the great need for greater factors of safety in the vital parts of automobiles, trucks and tractors, and showed that the electric furnace would be called upon to supply steel of the proper quality.

In response to a demand for data on electric furnace products, the association has issued a booklet, containing such information as had been gathered. This effort was commended by those who attended.

At the meeting a permanent organization was effected and the following officers elected: President, Acheson Smith; vice president, C. H. Booth; secretary, C. G. Schluederberg and treasurer, F. J. Ryan. The executive address of the association is Box 616, Niagara Falls, N. Y.

It is thought that the next meeting of the association will be held next spring in conjunction with some of the national technical societies, and a symposium on the subject of power for the electric furnace will feature the meeting. Although the recent meeting was largely devoted to electric steel it is the intention of the association to take up the subject of nonferrous metals and other materials made in the electric furnace.

Among those who attended the meeting were L. E. Howard, of the Simonds Mfg. Co.; L. M. Reed, Haynes Stellite Co.; A. C. Jones of the Electric Steel Co., Chicago, W. F. Graham, of the Spicer Mfg. Corp.; E. S. Gardner, Illinois Steel Co.; Edward T. Moore, Halcomb Steel Co.; F. W. Chapman, of the Standard Steel Castings Co.; J. M. Blake, American Manganese Steel Co.; A. Trevor Jones, American Steel Foundries; A. H. Miller, Midvale Steel & Ordnance Co., A. U. Tirbutt, Manitoba Steel Foundries, Ltd., and many others interested in the electric steel industry.

Orders Held Up

For Refractories by Blast Furnaces and Steel Works Due to Strike

Pittsburgh, Sept. 30.—Makers of refractories are getting numerous requests from the blast furnace and steel interests to hold up shipments for the present, due to the strike. This in no way reflects a lack of demand, which still is reported to be good, but as much common labor is involved in handling the brick at the plants and this class of help, more than any other, is out on strike, shipments at this time would mean the tieing up of many cars and possibly heavy demurrage charges. This is the time of year when both steel and iron producers build up reserve supplies of refractories and a number of demands are coming out for shipment when the labor situation clears up.

Refractories

(Per 1000 f. o. b. works)

FIRE CLAY BRICK
(First Quality)

Pennsylvania	$36.00 to 41.00
Ohio	36.00 to 38.00
Kentucky	36.00 to 41.00
Illinois-Missouri	30.00 to 40.00

FIRE CLAY BRICK
(Second Quality)

Pennsylvania	$30.00 to 35.00
Ohio	20.00 to 25.00
Illinois-Missouri	25.00 to 30.00

SILICA BRICK

Pennsylvania	$40.50 to 45.00
Chicago	45.50 to 50.50
Birmingham	46.50 to 51.50

MAGNESITE BRICK
(Per Net Ton)

9 x 4½ x 2½	$80.00 to 85.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$80.00 to 90.00

BAUXITE BRICK
(Per Net Ton)

55 per cent.	$ 40.00 base
76 per cent.	100.00 base

Car shortages have been a factor in various producing interests for several weeks.

Decreased shipments have had no particular effect upon the operation of the brick plants, which are running between 60 and 70 per cent of capacity, or about the same rate as during the past month or six weeks. No special change has taken place in prices, but the market can be described as firm as not a few manufacturers are finding difficulty in getting back more than a new dollar for an old one on current bases. Labor is reported to be scarce and some companies have been obliged to increase wages to keep their organizations intact.

Agitators Sow Vicious Doctrines

Strike Talks by Organizers Reflect Radical Beliefs of Their Leaders — Foreign-born Workmen are Praised for Stopping Production and Forcing Americans Out of Work — Foster is Extoled

BY A. J. HAIN

WHEN the most radical leaders in the American Federation of Labor disregarded the advice of President Wilson and Samuel Gompers that the strike in the iron and steel industry be postponed until after the industrial conference they revealed a state of affairs in their own organization more menacing to the peace and welfare of the country than the conditions in the industry regarding which they complained.

If employers were to concede the truth of all the charges made by those radicals the people of the United States still would have more cause to fear the radicals than the employers. Questions pertaining to the open shop, the 8-hour day and rates of wages become of secondary importance when men of revolutionary tendencies ignore sane counsel and demonstrate that by appealing to the prejudices and passions of the foreign-born workmen they can force their will on a far superior number of Americans and interrupt a vital industry.

If the average American citizen could get in close contact with the campaign waged by the radicals; if he could hear the organizers, who take their cue from John Fitzpatrick and William Z. Foster, he would see the issue presented by the strike in its proper perspective. The average American citizen considers the strike as merely a controversy between the employers and employes in the iron and steel industry, something which does not concern him directly, if at all. But if he could attend the innumerable organization meetings and listen to organizers expound their doctrines, without moderation as on the witness stand before the senate investigation committee, he would realize that it is an issue of Americanism. If he could hear the little Fitzpatricks and Fosters tell thousands of applauding foreign-born common laborers that they deserve wealth, luxury and authority because they closed the mills while the American workmen did not have the courage to act he would know the deeper significance of it all. He would say that right or wrong, regardless of the merits of the case as stated by Samuel Gompers, they deserve to lose the strike. They deserve to lose it not only because of their precipitate action in paralyzing a great industry primarily to wrest power from the more conservative element in their own organization, but because they are inciting men against orderly form of government.

Studies The Strikers

RADICAL doctrines in their worst form are being preached by the agitators to the foreign workmen who constitute overwhelmingly the body of strikers in the present attack upon the steel industry. The ignorant, half-Americanized or unamericanized are being incited constantly to the pursuit of principles and the adoption of methods which are subversive of American institutions. To ascertain exactly what kind of vicious propaganda and deception the strike leaders are employing to keep the men in line, THE IRON TRADE REVIEW *had Mr. Hain of its regular staff spend several days in close contact with the workers in the Mahoning valley and in the Cleveland district. What Mr. Hain was able to develop and tells in the accompanying article, portrays accurately the dangerous character of the present strike and the evil, unscrupulous means used by the agitators to inflame the workmen. The fact that many of these rabid statements were made in meetings which were open to the public is suggestive of the violent and revolutionary utterances which it is reasonable to expect are made freely at the closed meetings.—Editor.*

"Don't Use Violence, But—"

Organizers at work in the centers of the industry stop short of the methods of the syndicalists as described by Foster only in this respect: They do not openly advocate the use of violence. They suggest that at some future time it may be necessary to do so, but they realize that the time is not opportune. Intimidation is a common practice; the wives and children of workers have been threatened and they have been warned that the men would be killed if they persisted in working; grocers, butchers and other tradesmen have been told that they would be killed, or that their stores would be burned if they sold provisions or gave credit to the workers, but in public meetings the organizers carefully refrain from advocating the use of force. An organizer will exaggerate conditions; he will play on the feelings of his audience, arousing hatred for employers and public officers and employes, and then as if to make his alibi secure he will tell the men not to carry firearms or resort to acts of violence.

The governor of Pennsylvania is the "Czar," the police are cossacks "who are riding into our homes and murdering innocent women and babes," because "they are ordered to do so by Kaiser Gary." If the mills are not opened when the strikers choose to return to work then the strikers must seize them, because they belong to the strikers; and if the government does not consent to operate them, then the laborers must operate them for their own account! The speeches of the organizers of the American Federation of Labor working under the direction of the committee in charge of the strike is tainted with revolutionary propaganda. Syndicalism has compromised on the question of force to win the support of the "peaceful radicals," but it is biding its day.

The agitators forced the stoppage of an industry in which they could claim but 20 per cent of the employes as their recruits. If they win the strike and gain complete control of the American federation it may be but a matter of a few months before they force suspension of other great industries. Resistance then may be fraught with serious consequences. It is that possibility which concerns every American.

* * *

GOMPERS testifying before the senate investigation committee said: "The disposition toward radicalism is so great now that democracy is sneered at by certain groups who say it is only a pretext which the employing classes hold up to cheat workers, and the workers can only secure justice by revolution."

While Gompers told the committee

THIS PICKET FOUND LIFE SO DULL HE TOOK ALONG HIS COCK-A-DOODLE-DO TO KEEP HIM COMPANY. WAGES HAVE BEEN SO GOOD, STEVE THOUGHT HE COULD AFFORD TO STRIKE FOR A WHILE

Foster has changed his views since writing "Syndicalism," the statements made by organizers indicate that they are in sympathy with the teachings in "Syndicalism," and Gompers' testimony shows that he knows it.

"There is not a squarer man in this country than that man Foster," said J. E. McCadden, an organizer for the federation, in addressing 1000 foreign-born laborers in Holy Name church, a stone's throw from the Ohio plant of the Carnegie Steel Co., Youngstown.

"Foster doesn't deny writing a book, but he's been all through that game and he says we're on the right track today. He has slung all the weight of his influence to you. He is a bright, honorable, upright man, and he doesn't leave a point unturned for you.

"They have been calling you a bunch of ignorant foreigners, but who makes the machines, the watches, the aeroplanes? You fellows," said McCadden. "If you fellows are a bunch of ignorant foreigners how are we going to class some of the employers? Some of them are not entitled to citizenship. They'll say, 'This Hunky, over here,' or 'that wop, over there,' only to get you to fight among yourselves. But, thank God, you know what you want, and how you're going to get it.

"I have been in labor organizations for 22 years, and it's the pride of my life the way you fellows have been sticking together and conducting yourselves. I would gladly die for you men! You are the most gentlemanly men of all the men that ever went out on a strike. I never in all my life saw anything like it and the history of the world never saw a squarer bunch than came out. The entire labor movement is back of you. The papers of the United States came out the other day and said Sam Gompers, president of the United States—I mean United federation—was against calling this strike. That was done only to discourage you.

"While I'm here I want to say a few kind words for Governor Cox. He's with the labor movement. That's why we haven't anything to contend with in Ohio as they have in Pennsylvania."

McCadden paused, gazed intently at his audience, and poised himself for dramatic effect. "In Pennsylvania," he said, "they are clubbing men, women and children—those infernal cossacks! They are driving right up on their steps and shooting right through ther houses! By order of the Steel corporation! Believe me, it's pretty near time you belonged to a labor organization.

"The corporations have their organizations to fix prices. How can they tell us we can't organize to fix the price at which we will sell our work? We are denied that right by Kaiser Gary! It's time you woke up and realized what you can get for your work. You are entitled to better homes, better clothing for yourselves and your children. The corporations don't believe in education if they can hold us down!

McCadden went on to explain the present demands of organized labor:

"Collective bargaining. That is a God-given right to organize and deal with the pirates of the earth. We want back pay for the time we have been out, or laid off. Mr. Boss gets his pay for the time he's sleeping. Let us get ours. Let us get ours so we won't have to work seven days a week to get it. We never want to be compelled to work 24 hours. We want sufficient wages to guarantee the American standard of living. Now what's the American standard of living? Wine and whisky and all the telephones they want—to order their steaks—that's their idea. But we want enough so we can feed our families. You hear a lot about a fair day's pay for a fair day's work, but we realize we are getting old; it won't be long before we can't work, and we want a little something extra to lay up for the rainy day. That's our idea of the standard of living! All we want! Clothes, food, theaters and automobile rides occasionally, for the laboring man, too! Not to sacrifice our children by letting the corporation tell us what we've got to work for.

"Then there's the double rate for Saturdays and Sundays and overtime. You want to get enough in eight hours so you won't have to work longer. Let 'em put the idle men to work if they need more men. If we've got to work overtime let us penalize them; if it costs more they'll put the other fellows to work. We've got to do it to beat these parasites of the earth!

"You men should be allowed to see your children in the daylight. Some of you haven't seen your children until this strike. My God! Is there anything more inhuman! Bringing up families without seeing them. I say this damnable corporation has got to stop this sort of thing!

"Gentlemen, you are going to lengthen your lives by joining this union, by getting better clothes, better food, and sanitary conditions throughout the country. It's absolutely the fairest clause that was ever put into an agreement.

"I'm no fire eater, but, by God, I'll tell you, you men are going to live!" he exclaimed. "Men who couldn't make a wheelbarrow are telling you they are going to close the mills. You men closed the mills and you will open the mills. If they don't open up the mills, the mills over in Europe will be only too glad to fill the orders and then you fellows can go back there for a little while and make good money. They are losing millions every day you stay out; you can't lose if you stick together and do just as you have been doing; they've got to give you what you want!

"They say the mills are going to stay down. That is the foolishest damn argument ever made. We must have iron, and if they don't open the mills the government will. Let us take the mills, and operate them; why should we make millions for the other fellows?

"All we've got for the boys who are bleaching over there is political democracy, not industrial democracy!

"You foreigners, as they call you, are putting the Americans to shame.

You're entitled to most of the benefits that may come of this strike. The Americans had to stop because you made 'em stop—now they're coming in. The so-called foreigners are entitled to all of the gains of this movement. You are the real leaders!"

In East Youngstown recently federal officers raided a hall, the headquarters of a group of syndicalists, who were working among the men of the Youngstown Sheet & Tube Co. That group advocated the taking up of arms to take the mills by force. The officers sought to catch "red handed" several leaders whose identity has not been revealed. They arrested 120 men, all but two of whom subsequently were released, but they did not find the men for whom they were looking. In East Youngstown there is a strong suspicion that the leaders whom they understood were to attend the meeting are included among the leaders of the strike movement.

* * *

AT A meeting of several hundred laborers in Cleveland, J. J. Keane, an organizer, told of an argument he had with a plant official.

"'Do you mean to tell me those common laborers are worth as much as the machinists?' he asked me," said Keane.

"'I certainly do,' I replied. 'Haven't they got stomachs? Haven't they got wives and children? Don't they deserve to eat the same as others?' And I told him they were going to eat a little cold turkey, too, I did.

"All we are demanding, men, is a living wage. You know you can't buy a suit of clothes that is fit to wear these days unless you pay $50. I went into a store the other day to buy an overcoat and the dealer showed me one for $100. Just think! One hundred dollars for an overcoat! Fifty dollars for a suit of clothes for you. Where are you going to get the money? How are you going to do it making $60, $70 a month?

"We have got to fight this out together. It's our chance, if we stick together. Sign up! Get your friends to sign up! If we win it means we are going to have some of those things the bosses are enjoying, but if we lose you might as well tie a shot around your neck and go to hell.

"The reason the men didn't go out in Lorain is because they are scared. They are working 10 and 12 hours a day down there, and yet Judge Gary is saying they are working because they are satisfied. We are going to show up that bird. He isn't sleeping well these nights. He has all the luxuries, more than he needs, while the poor devils who are working for him can't make a decent living.

"Mayor is With Us"

"Experience shows that the less hours you work the more you will get paid for what you do. But you have got to organize to do it. Look at the other fellows; the street car men, for instance; the railroad men; they-ve got enough sense to organize and stick together, and that's the reason they get what they want. Why, we have all the power on our side, if we only organize to use it. We've got to get together and talk our business over, like men.

"I heard of a case where a policeman standing outside of a plant saw some men. The policeman said: 'If you want to go in, go on in.' They looked like strike breakers. We went to the city hall and told them about that; they told us the next time we hear of a case like that to take the policeman's number and they would attend to him. So when you see a policeman telling those guys to go in, just take his number. We will get those kind of birds.

"I never knew of any city before where the mayor said he would run the strike breakers out of town. That shows he is with us. It shows we've got 'em going. We are winning the strike."

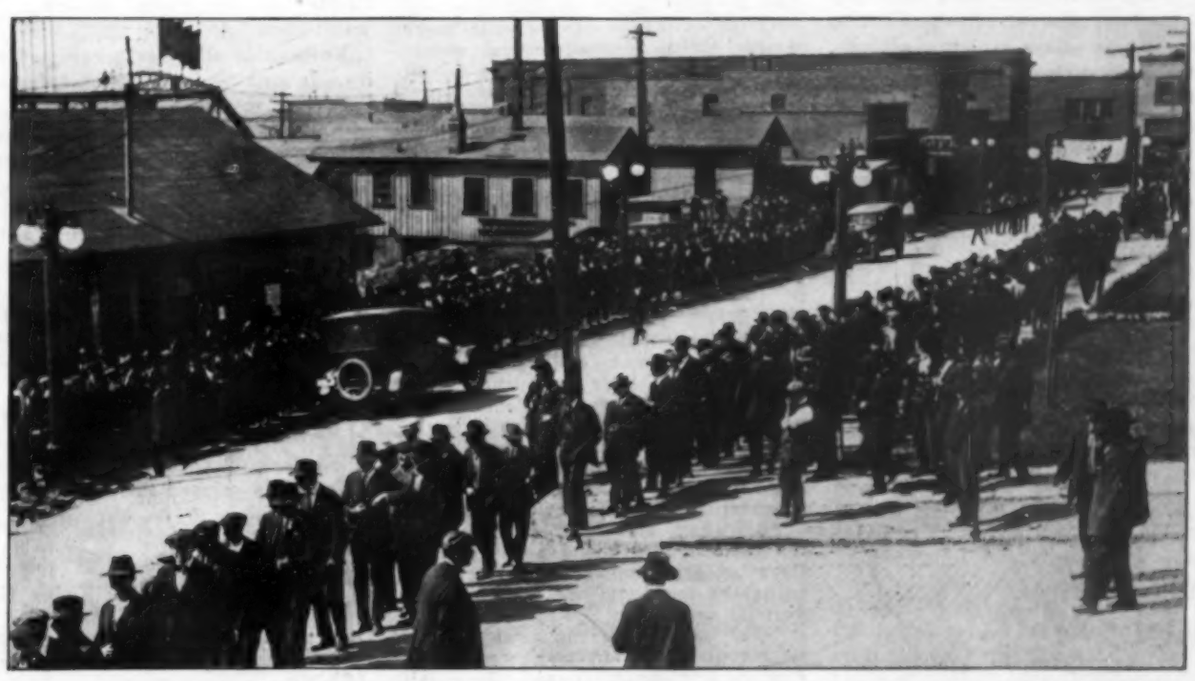
The *Plain Dealer*, the leading newspaper in the Cleveland district reported the meeting at which Keane made his statements as follows:

J. J. Keane, American Federation of Labor organizer, and John Luthringer, business agent of the machinists' union, addressed a meeting yesterday in Stoke's hall, St. Clair avenue, near St. Clair street, in which both cautioned the strikers to preserve order. "Stay completely away from the factories," they urged.

Luthringer, an organizer for the federation said at the meeting:

"The employers are up to their old forms of treachery. We had a lot of talk about propaganda during the war but it can't compare to the insidious propaganda of the employers. It shows that if you lose this fight you are going down to the bottomless pit.

"The war taught us the greater benefits of democracy. We sent our boys over there to die for humanity, and we were given to understand that



PAYING OFF WORKMEN AT THE YOUNGSTOWN SHEET & TUBE CO.'S PLANT. NO SIGN OF POVERTY OR STARVATION AMONG THESE MEN. MANY OWN HOMES, AUTOMOBILES AND HAVE BANK ACCOUNTS

this world would be a better place for us to live in; we were told that every man would get more of the good things of life, but you know you haven't. President Wilson gave you the right of collective bargaining, and don't you let anybody take it away from you. The way to bargain that way is to let your union bargain for you, by signing up."

The chairman of the meeting, a young man who spoke with a foreign accent, explained the situation to a group of men after the meeting.

"The mayor is with us," he said. "The mayor is seeing that no strike breakers are let in. The other day they took 60 off a train from Detroit and shot them back. Don't you fellows carry firearms—but if you can stop 'em without breaking their heads, why do so. We'll stand back of you."

He impressed on the men the importance of getting others to join the union.

"I'll tell you how this works," he said. "We had only 200 men at the Lakeside plant (of the Otis Steel Co.) in our union. They had 1300 men there, but we made 'em shut down. That's what we can do."

* * *

WHAT caused the strike? The professional labor agitator saw an opportunity to capitalize an impression created in the minds of foreign-born workmen during the war that employers are making fabulous profits, and that they are entitled to a greater share of it, in accordance with the principles of democracy.

Common laborers, for whom the agitators are shedding tears, are well dressed, well fed and well housed. A great number of the younger men now idling away their time near the mills and in the streets wear silk shirts. There is no evidence of starvation or poverty, but many indications that so far as physical comforts are concerned the laborers have every reason to be contented. Nowhere in the Mahoning valley or elsewhere are there indications that the men are oppressed, overworked, or as the agitators say "in the depths of despair."

The strike is considered by the men in the nature of a diversion, a holiday, a gamble against the loss of a few days' wages that their leaders will succeed in getting more money for them. It is a strike without the impetus and force that come from the determination of a great body of men to wipe out an injustice, it is a strike for the luxuries of life, based on wrong premises and fomented by agitators who have nothing in common with those whom they claim to represent, except as they might be able to use them to gratify their own personal ambitions.

Storekeepers in the strike centers will tell you that all classes of men who work in the mills have more money, and spend it more lavishly, regardless of high costs, than they ever did before. Bankers in those communities say many laborers have on deposit with them from $2000 to $5000. A storekeeper in East Youngstown, catering almost solely to the foreign laboring class, said that before the war he had silk shirts for sale at $2.50, but the laborers could not afford them. Today the shirts cost from $5 to $10, and the laborers are wearing them. They are wearing better clothes, and their wives and children are wearing better clothes than they ever did, and the laborers are paying more for them.

Workers' Conception of 8-Hour Day

"What of the demand of the 8-hour day?" I asked the employment manager of one of the largest independent corporations. He replied:

"I have had thousands of foreigners apply to me for jobs, and I can say that the great majority of them, as one of the conditions for going to work, have insisted that they be given an opportunity to work extra time, even on Sundays. They consider a 10-hour job better than an 8-hour one, and if they are given a 12-hour job they consider that better still. The reason is they want the opportunity to get time and one-half for overtime. So many of them have wanted this opportunity that there was no other thought about it until the labor agitators appeared.

"The agitators told the men they should receive the money they now earn in two hours for eight hours. If they win, and wages are raised, they will be right back demanding they be given a job so that they can work 10 or 12 hours to make more money. It is a time-serving proposition with them; if we had a 6-hour day, six days a week, and if wages were established on a fair basis, they would want to put in more time. Education and advancement along lines of American workmen do not figure in their calculations. The less work and the more time, the better they are satisfied.

"Uneducated, untrained and, often, unwilling workers have the notion that because they can wield a pick and shovel, or lift a heavy weight they are entitled to the fat of the land, fine homes and automobiles. The agitators have told them that they, the producers, are entitled to what they produce, and that it is the policy of this country to give it to them. There are thousands of them so firm in that belief that they would shoulder guns tomorrow, to fight it out, if their leaders told them, and the number is growing and will continue to grow until the government curbs the men who are preaching industrial unrest.

"We have laws opposed to restraint of trade, but no laws to prevent a few agitators and their followers from depriving thousands of others of work. We think we have solved the problem of wars and have made it impossible for them to recur, but we shy at the problem of prohibiting strikes, and we jeopardize the whole country for fear of treading on the toes of a few agitators."

Public sentiment in the steel producing centers was opposed to the strike. Newspapers, except in a few instances, have not publicly taken sides in the controversy as a matter of policy, but the newspapermen investigating and reporting the strike say the men did not have sufficient cause to tie up the mills. Go anywhere in the strike districts, question professional men, tradesmen, bankers, lawyers, clergymen and you will find a unaniminity of opinion—the men were not justified.

S. T. Hammersmark, in charge of the strike in the Youngstown district, went into a bank where he has funds on deposit. The president of the bank called him into his private office and asked him how the strike was going.

"Fine, fine," said Hammersmark. "The heads of the companies here are treating us fair. It is the first time in history when strikers have received so much consideration from the companies against whom they have struck. They are gentlemen; I will have to say that for them."

The writer asked scores of strikers why they quit work.

"To make Mr. Gary talk," said one.

"Union say 'go out' I go out," said another.

"One hundred fifty millionaire last year," declared another, meaning that he understood 150 millionaires were "made" in the United States. "Me want some."

Not one of all those questioned said he was striking for an 8-hour day.

In the meantime, the idle men are losing $14,700,000 a week in wages. The country is sustaining a tremendous economic loss, and if the "prestige" of President Wilson is upheld the men will go back to work before their claims are even considered.

"Prestige" is suggested by the fact that when Mr. Fitzgerald was asked by a member of the senate committee why the workers went out he said it was to uphold the prestige of the President. The President, he said, had asked Judge Gary to grant the union leaders a conference, so when Judge Gary refused there was nothing for the union to do but uphold the President's prestige.

The agitators are said to have seized on the point that Judge Gary would not confer with them, and to have made the most of it in talking with foreigners.

"I believe they are just as well satisfied now that Gary did not receive them," said a plant official.

Probe Bares Iniquity of Strike

Gompers and Fitzpatrick Before Senate Investigation Committee Display Ignorance of Actual Conditions in Steel Industry—President of the Federation Yields to the Radicals—Congressmen Demand Action Against Strike Agitators

WASHINGTON, Sept. 30.—Hearings begun last Wednesday morning before the senate committee on education and labor on the resolution of Senator Kenyon, chairman of the committee, to investigate the steel strike, have developed two especially significant facts.

First, Samuel Gompers, president of the American Federation of Labor, in his testimony on Friday morning committed himself to the side of the radical element of the federation, giving unqualified approval to William Z. Foster, secretary-treasurer of the steelworkers' organization committee.

Second, the failure of either Gompers or John Fitzpatrick, chairman of the committee, the first witness, to make a case against the employers.

Both witnesses showed an almost total absence of knowledge of working conditions and wages in the iron and steel industry.

It developed during the hearing that the sentiment of congress, and perhaps that of most of official Washington, is overwhelmingly against the strikers.

Agitators Condemned in Congress

The strike agitators have been condemned in both the house and senate. Representative John G. Cooper, Youngstown, O., a member of the Brotherhood of Locomotive Engineers, bitterly assailed Foster. He warned labor not to heed the radicals, who, he said, are trying to destroy the American Federation and stir up a country-wide revolution.

Senator Thomas, of Colorado, introduced a resolution, referred to the committee on judiciary declaring the closed shop unamerican and proposing to make labor combinations unlawful. Senator Pomerene, Ohio, severely criticized Foster and said that unless he and his kind are removed from power, organized labor will be ruined.

Representative Kahn, California, conferred with Attorney General Palmer and urged federal prosecution of Foster on the ground that he is inciting revolution in the United States by his writings. It was disclosed that the attorney general has secret service agents investigating the activities of the strikers.

Reports received in Washington indicate a favorable attitude taken by broad-minded men throughout the country on E. H. Gary's refusal to arbitrate the principle of the open shop.

Labor leaders declare Gompers has capitulated to the radicals as a matter of expediency to save himself from being dethroned as the head of organized labor. It is believed that the federation must soon come out openly in favor of the most radical views or oust Foster and his followers. Gompers is well aware of this fact, and it is said that he is preparing to jump to that faction which will predominate. Yet others claim Gompers, by reason of his approval of Foster is nearing the end of his connection with the federation, which they insist will not be destroyed or turned over to the radicals.

A few days before Gompers appeared before the senate committee on education and labor, he said to the senate committee on interstate commerce: "The strike is now on, much to my regret, because I wanted to see it delayed until after the President's industrial conference." The statement does not accord with one he made before the committee on education and labor. He told the latter that he could not escape the conclusion that the calling of the strike for Sept. 22 was justified. These statements are interpreted as an attempt by Gompers to "straddle."

Ignorant of Conditions

Fitzpatrick assailed the United States Steel Corp., employers generally, the Pennsylvania state constabulary, and mill town officials. Neither he nor Gompers were able to give specific facts leading up to the strike. They said they had no personal knowledge of conditions of workmen in the steel industry. Fitzpatrick proved amazingly ignorant of facts regarding hours of work, wages, and living conditions of steel mill employes, but frequently resorted to theatricals to impress the senators.

Gompers, shrewder than Fitzpatrick, made a clearer statement, but was unable to answer satisfactorily important questions put to him, and failed to produce the impression he evidently hoped to do.

Interest now centers in the testimony to be presented to the committee Wednesday by Judge Gary. The committee probably will go to Pittsburgh and perhaps take the testimony of workers, managers of steel mills and officials of mill towns.

Senator Kenyon announced that he desires to close the hearing at the earliest practicable date to determine whether any federal action is warranted.

Foster "Reformed" Praised by Gompers

WASHINGTON, Sept. 30.—During the course of his testimony last Friday before the senate committee on education and labor at the steel strike hearing, Samuel Gompers, president of the American Federation of Labor, presented only one illuminating, outstanding fact worthy of serious consideration. That fact is that he gave unstinted approval of William Z. Foster, the author of "Syndicalism." All the other statements of Mr. Gompers, accompanied by cultivated gestures, an autocratic cocksureness, and lordly demeanor, were relatively unimportant. His actual knowledge of the steel strike was negligible. All the information he could offer admittedly was based on hearsay.

The hearing of Mr. Gompers was nearing an end, when Senator Kenyon, chairman of the committee, asked him pointedly about Foster's writings, and the charge that radicals are trying to get control of the American Federation of Labor.

"I have heard the saying, 'O, that my enemy might write a book!' " began Mr. Gompers. "When it was reported Foster, the I. W. W. delegate, wanted Mr. Duncan, vice president of the American Federation of Labor, excluded from the labor conference in Zurich I classed Foster with Heywood.

"It was a year or so later, about 10 years ago, that Foster wrote his pamphlet on syndicalism. About one year after that pamphlet was written I was at a meeting of the Chicago Federation of Labor and was called upon to make an address. One delegate arose and expressed thorough approval of my address. I did not know who the delegate was. Much to my amazement after the meeting I found out that the delegate was Mr. Foster. I addressed a letter to him, expressing appreciation of his change of mind and telling him that by pursuing such a constructive policy as he had outlined in his approval of my address he could be of service to the American Federation of Labor and I encouraged him.

"I am willing to build a golden bridge for my enemy to pass over, and to help an erring brother. In view of what Mr. Foster has done to improve working conditions in the Chicago stockyards, and in view of what he is doing now, he is entitled to something better than to be held up to the contumely of the public."

"So there is no doubt that Mr. Foster has changed his views?" asked Senator Kenyon.

"I would not serve with him if he had not changed his views," replied Mr. Gompers.

But, despite the attempt of Gompers to give Foster a clean bill of health, the idea apparently persists among members of the committee that Foster still is a man of radical ideas. If he does not express them, it is contended, it is only because he thinks he lacks power to support them.

Gompers attempted to give the issues of the steel strike, what led up to it, and what followed. The issues, he said, are the right of employes to be heard through their representatives and to have something to say about their hours, wages and working conditions. These rights, he asserted, have been denied for the past 25 years with all the power, influence and determination of the corporations. More indirectly, he said, they were denied by illegal and unwarrantably brutal means.

He endeavored to show that the corporations through collusion with steamship lines, including the German-American, North Lloyd's and the Hamburg company, brought men from southern Europe, the Balkan states, etc., and said that if trouble now arises the responsibility lies with the corporations.

Mr. Gompers said employes work 365 days a year and 12 hours a day, operating in shifts of two weeks, and during the transition from night to day work work 24 hours straight. Recently the Steel corporation ordered into effect the 8-hour day, but, he said, his understanding was that "there was more in the order than in its ob-observance."

"You have said that the Steel corporation tries to operate the open shop," said Senator Phipps. "Will you tell the committee the attitude of the American Federation of Labor about the employment of nonunion men in shops which have been organized?"

"The American Federation of Labor has nothing to do with it," said Gompers. "That is up to the national trade unions, whose policy is to try to organize the workers 100 per cent."

Senator Phipps asked Gompers if he could give instances where superintendents of plants refused to meet workmen to hear grievances. Gompers said he could state "instances without number," but instead of doing this he merely had his secretary read a resolution adopted at the convention of the federation in St. Paul in June of 1918, demanding "the rights of citizenship" to confer with employers over grievances.

He told of attempts to secure a conference for the committee with Chairman E. H. Gary, of the United States Steel Corp., and the failure of President Wilson to bring about the conference, after the committee asked the President to help it.

Writings of Woodrow Wilson in 1907 and 1909 bitterly condemning labor unions were read by Senator Phipps, who asked Gompers if he thought the President had changed his views since then. Gompers told what Mr. Wilson as President had done for organized labor, and declared the President has changed his views.

"Why was not the strike postponed, as requested by the President, until after the industrial conference?" asked Senator Kenyon.

Gompers said he wrote to Fitzpatrick urging that the strike be postponed as requested by the President, a copy of the letter being given to all 24 presidents of the international unions. A few days later he received a letter from Fitzpatrick saying it would be impossible to hold the men, although some of the presidents of the union favored deferring the strike.

"Do you think their action was justified?" inquired Senator Kenyon.

"I cannot escape the conclusion that the favoring of the strike as originally planned was justified," replied Gompers.

Senator Sterling mentioned the high wages paid by steel companies to skilled workers. Gompers sneered.

"It is a favorite pastime of a few interests to pay big wages," he said. "They are like the man dangling the carrots on a pole before the horse to make him run faster. These men are really 'sweater' men. And they have to pay their helpers out of their own wages."

Senator Sterling then proceeded to show the average day wage paid to employes of the Steel corporation is $6.23. Gompers remarked in sarcastic tone about the misleading character of averages. He did not think much of the pension or bonus plan of the corporation, and its welfare work, he said, could be best explained by using the terms of the seamen, who, he said, call it "hell-fare" work.

Fitzpatrick Ignorant of Conditions

WASHINGTON, Sept. 29.—Groping and dealing in generalities, admitting that he does not know anything about the practical operations of the steel industry and never was inside a steel mill, John Fitzpatrick, chairman of the steel workers' organization committee, made a poor witness before the senate committee on education and labor last Thursday when it began its investigation of the steel strike.

Fitzpatrick was especially weak in his testimony when he attempted to reply to specific and searching questions by Senator Phipps, of Colorado, former treasurer of the Carnegie Steel Co., whose practical knowledge of the steel business discomfitted him. During his testimony Fitzpatrick said he was willing to submit the union's demands to arbitration.

Attorney W. B. Rubin, counsel for the steel workers' committee, sat at the left of Fitzpatrick, often aiding him when difficulties arose in answering questions.

Fitzpatrick read telegrams and told of efforts of the committee to have a personal conference with Chairman

E. H. Gary, of the United States Steel Corp. Then he began a tirade against the corporation and its alleged vicious treatment of employes. He told the committee union men considered all mills were Steel corporation mills, no matter what name they had over the door.

He declared the Steel corporation 18 or 20 years ago (it was incorporated in 1901) appropriated "from $2,000,000 to $20,000,000" to destroy unionism.

Replying to a question by Senator Jones, New Mexico, Fitzpatrick said the organization of the men was begun upon the initiative of the American Federation of Labor and not at the request of the men themselves. He told of the alleged spread of unionism among the men, and of opposition, which, it was asserted, was met at Homestead, Duquesne, Clairton, Pa., and other points in western Pennsylvania, "where conditions worse than the padrone system prevail."

By May, 1919, Fitzpatrick said, something like 80,000 men in the steel industry had been organized in the Calumet and Pittsburgh districts. Fitzpatrick threw some light on the conference between the committee and President Wilson when he said it was its purpose to lay the "horrible conditions" in the steel industry before the President and to ask the latter to try to arrange the conference with Judge Gary. The President, according to Fitzpatrick, promised to try to arrange the conference and did make the attempt, but failed.

"How many men voted to strike?" inquired Senator Wolcott.

"I do not know the number who voted," said Fitzpatrick, "as each union sent in a report instructing us of the percentage voting for the strike."

Fitzpatrick said that 98 per cent of the members of the union voted for the strike and that 50,000 men had joined the union between July and the time of voting, "making the total membership of organized workers in the steel industry at that time 150,000."

Senator Kenyon, Iowa, chairman of the committee, asked Fitzpatrick if there would have been a strike if Judge Gary would have granted a conference.

"No, sir," replied Fitzpatrick.

"If Mr. Gary were now to consent to a conference, would that end the strike?"

"I don't think so," replied Fitzpatrick. "The 350,000 men on strike will not return to the mills until they get decent consideration or until congress gives us justice."

The senator wanted to know why the strike could not wait, as suggested by President Wilson, and Fitzpatrick referred to the letter from the committee to President Wilson, in which it was said the men could not be restrained, etc.

Fitzpatrick volunteered the statement that had they waited "the 24 presidents of the international unions would have been shot to pieces by the steel company gunmen, and mill town officials." He added that he never went to western Pennsylvania without first kissing his wife and children goodbye, because he never expected to see them again.

Senator Kenyon asked Fitzpatrick if all the strikers are affiliated with the federation.

"Yes, sir," he replied.

"Can you produce records showing the actual number of men who voted for the strike?"

"I shall try to produce those records," said Fitzpatrick. Rubin quickly said that that could not be done "unless the steel workers' committee knew the subsidiaries of the Steel corporation."

Replying to a question by Senator Wolcott, Delaware, Fitzpatrick said all of the 150,000 union men had the right to vote and that a vote also was taken among nonunion men, "all of whom except two voted for the strike." Fitzpatrick scoffed at the idea that Americans did not want to strike.

"But Representative Cooper has made the very serious charge that the strike was declared by aliens," said Senator Kenyon. Fitzpatrick replied that he did not state the proportion of Americans and aliens who voted to strike, but said there were only a few who could not speak English.

After stating alleged sacrifices of steel workmen and their families during the war for the United States, Fitzpatrick said:

"If what is going on in Pennsylvania continues it will not be confined to the steel industry. Nobody can tell what the outcome will be. In Homestead the cossacks rode in a house, knocked a pot of food from a stove on a woman with a child in her arms and scalded her."

"What was your former occupation?" asked Senator Phipps.

"I am a horseshoer by trade," said Fitzpatrick.

"Have you had any actual experience in steel mills or foundries?"

"None. I have no knowledge of the steel business except that I get from the steel workers."

Asked as to wages paid in the steel industry, Fitzpatrick told Senator Phipps he could not say what they are. Mills, he said, operate on a 12-hour basis."

"Don't you know," asked Senator Phipps, "that Steel corporation mills for the past two years have operated on the 8-hour basis, except where continuous operations are necessary?"

Fitzpatrick evaded the question and admitted he could not say what percentage of employes work on a 12-hour basis. Phipps asked if he knew some skilled workers get $20, $40 and $60 a day. Fitzpatrick said those wages were only "pittances" when consideration is given to the "awful conditions" under which they work. Senator Phipps also challenged the statement of Fitzpatrick that the men worked seven days a week, saying they worked six days, except in some departments, such as blast furnaces, and that as a matter of fact the 10-hour day, six-days-a-week plan is generally followed.

Foster an I. W. W. Says Senator Pomerene

Washington, Sept. 30.—"God help labor when it gets into the clutches of men of that type!" exclaimed Senator Pomerene in the senate last Friday, in referring to William Z. Foster, secretary-treasurer of the steelworkers' organization committee..

Senator Pomerene read from a letter published in *Solidarity*, the official organ of the I. W. W., on Nov. 4, 1911, in which Foster urged the I. W. W. to "work within the American Federation of Labor to make it a revolutionary organization." The letter was commented on in an article appearing in *The Christian Science Monitor*, which said Foster at that time was a candidate for editor of another I. W. W. publication, *The Industrial Worker*, published at Seattle, Wash. The letter of Foster said in part:

"I am satisfied from my observation that the only way for the I. W. W. to have the workers adopt and practice the principles of revolutionary unionism—which I take is its mission—is to give up the attempt to create a new labor movement, turn itself into a propaganda league, get into the organized labor movement, and by building up better fighting machines within the old unions than those possessed by our reactionary enemies, revolutionize these unions, even as our French syndicalist fellow workers have so successfully done this."

This letter was signed, "Yours for revolution, William Z. Foster."

"And now this man, with that record, which he himself wrote in 1911, is parading himself before the public as one of the friends of labor!" declared Senator Pomerene.

The senator then read from the pamphlet which was issued by Earl C. Ford and William Z. Foster from

(*Concluded on page* 920)

Labor Gets Most of Mill Income

Study of Reports of Four Important Steel Companies Reveals Profits Equivalent to Less Than $2 Per Employe Per Day in 1918 — Under $1 in June Quarter — Men Misled by Uneconomic Teachings — General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

CONTENTIONS of loose-tongued prophets of discontent that labor is not receiving its fair division of the earnings of industry are shown to be utterly without basis of fact, at least insofar as the steel industry is concerned, by the results of a study made by THE IRON TRADE REVIEW covering the reports of four large representative iron and steel companies.

This survey lays bare the fallacy of the theory that companies are wont to gobble up in profits from 80 to 90 per cent of the value created by labor. Instead of profits being vastly greater than wages, they are shown to be invariably smaller and in some instances amounting to but a fraction of the share that goes to compensate labor.

As indicated by the accompanying tables the companies included in the study were the United States Steel Corp., the Republic Iron & Steel Co., the Bethlehem Steel Corp., and the Lackawanna Steel Co.

Had the net profits of these companies for 1918 been pro-rated among their respective employes each man on the payroll of the Steel corporation would have received a daily additional income of $1.48; Republic's employes would have received $1.69 each; Lackawanna's $2.21, and Bethlehem's $0.54.

Had the same process been applied to the profits of the June quarter of 1919 employes of the Steel corporation would have benefited to the extent of but 84 cents daily; Republic to the extent of 45 cents, while Lackawanna shows a deficit for the period equal to 25 cents for each employe.

The study further shows that instead of increasing since 1913, the proportion of net profits per man per day to the average daily wage per man actually has receded. In 1913 the net profits per day per employe for the Steel corporation were 39 per cent of the average daily wage; in 1918, the war period, they were 27 per cent; and for the June quarter, 13 per cent.

In 1913 the net profits of the Republic company expressed in terms per employe per day were 30 per cent of the average daily wage; in 1918 they were 32 per cent and in the June quarter they were 9 per cent. Bethlehem shows a similar record with net profits of 38 per cent of the average daily wage in 1913 against 9 per cent in 1918. No record of Lackawanna for 1913 is available.

The discrepancy is shown even greater when total wages are compared with the sums diverted in dividends to preferred and common stockholders. The corporation's employes received $452,663,524 in wages during 1918 while its stockholders were given but $96,382,020. Republic's stockholders drew $3,381,460 while labor got $23,747,260 from the earnings. Dividends of the Lackawanna company amounted to $2,983,287 as compared with $20,503,737 devoted to labor. The most amazing record in this respect was made by the Bethlehem company with $167,118,484 for labor's compensation and $9,386,160 for the compensation of stockholders.

The increase in wages since 1913 for all of the companies and particularly for the Steel corporation and Bethlehem have been far greater than the advance in dividends. For instance the annual payroll of the Steel corporation since 1913 to 1918 increased 113 per cent while dividends increased 92 per cent. The Bethlehem company discloses a remarkable increase in wages, over the period, of more than 1100 per cent while dividends advanced but 350 per cent.

The facts as brought out merely serve to emphasize the utter preposterousness of the arguments of radicals and false economic teachers whose aim is to discredit the wages system in the eyes of labor. Labor has been led into the error of confusing gross earnings and net profits. The agitators have pointed to the huge figures representing gross and their followers unschooled in the essentials of sound business finance have taken only this total into consideration, giving no heed to the tremendous legitimate charges that must be made against the gross before the total income of a business is sifted down to the basis of net profits. The tax factor alone is a tremendous burden on business. The Steel corporation in 1918 paid $274,277,834 in excess profits tax to the government, a sum exceeding the dividends, but less than the fund for wages.

With invidious comparison and fiery oratory agitators have elaborated upon the vague fabulous earnings of steel companies and the comparatively modest income of the individual workman and the result, in the case of the ignorant or unthinking, has been discontent. In a recent address Charles Piez, former director general of the

How Earnings and Wages Compared in 1913

	Total number of employes	Total wages	Net profit available for dividends	Total dividends	Average daily wage	Net profit per employe per man
U. S. Steel Corp.....	228,906	$207,206,176	$82,004,683	$50,634,802	$2.92	$1.14
Republic Iron & Steel Co.	12,633	9,999,263	3,101,300	1,750,000	2.53	.78
Bethlehem Steel Co....	15,052	13,366,399	5,122,702	2,273,470	2.83	1.08

How Earnings and Wages Compared in 1918

	Total number of employes	Total wages	Net profit available for dividends	Total dividends	Average daily wage	Net profit per employe per day	1919 June quarter net per man per day
U. S. Steel Corp....	268,710	$452,663,524	$125,317,377	$96,382,020	$5.33	$1.48	$0.84
Republic Iron & Steel	14,688	23,747,260	7,791,933	3,381,460	5.17	1.69	.45
Bethlehem Steel Co..	93,964	167,118,484	15,930,399	9,386,160	5.68	.54	**
Lackawanna Steel Co.	12,015	20,503,737	8,348,354	2,983,287	5.45	2.21	*.25

* Loss.
** No quarterly report.

Emergency Fleet corporation declared that the idea that labor is not receiving a just share of profits underlies the general unrest. He asserts that numerous sane-minded, intelligent though misguided American workmen cling to this view, many of them believing that their employers are earning 350 per cent or more of the wages. Men in this state of mind are more susceptible, than others, to bolshevist poison inciting them to assume control of industries and expropriate the owners.

They see beckoning visions of great wealth that would accrue to them under "the new order" and to these deluded dupes the cold fact that equal division among them of the total fund now going to capital, providing the efficiency of industry could be maintained, would add only little more than one dollar a day to each individual's income, would come as a rude shock. But the efficiency of industry could not be maintained; production would drop off enormously, and while money wages might increase there would be a disastrous decrease in the supply of comforts and necessities of life.

Intelligent socialists realize that production is the great need and that to hold up the glittering prospect of riches to labor if the capitalists' fund were appropriated is a vicious and misleading falsehood. Yet it is only by this means that the masses could ever be moved to embark upon the insane experiments of radicalism. It is important that the masses be enlightened as to the facts for their own good.

American Ship '19 Output Breaks Record

The American Shipbuilding Co. produced the greatest volume of ship tonnage in its history during the year ended June 30, 1919, and gross earnings were $20,857,057 as compared with $16,206,662 in 1918, yet net earnings after allowing for charges and $7,434,181 for taxes were only $3,784,434 against $6,626,265 in the preceding year. General expenses in 1919 increased to $6,545,895 from the $1,931,641 for 1918.

During the year the company paid 7 per cent on preferred and 23¼ per cent on common stock. The balance sheet shows an expansion of assets and of liabilities from $60,230,769 to $152,584,437, construction work in progress being the chief factor in the increase. This item grew from $16,790,045 in 1918 to $100,431,229 in 1919. Cash grew from $10,300,476 to $14,416,960 in 1919, while United States securities held increased from $4,989,710 to $9,221,545. Inventories decreased from $4,814,984 to $3,803,163 in 1919.

According to President M. E. Farr the total cargo tonnage completed and delivered in 1919 was more than two and one-half times that of 1918. During the year 109 ocean cargo ships of 422,800 gross tons carrying capacity were completed and delivered. On June 30 the company had yet to deliver 63 ships to the United States Shipping Board Emergency Fleet Corp. The company sold the Scott Steamship Co. stock amounting to $550,000 at par. The comparative income account follows:

	1919	1918
Gross earnings	$20,875,057	$16,206,662
Other income	11,218,615	860,529
Totals	$32,093,672	$17,067,191
General expenses	6,545,895	1,931,641
Depreciation	945,921	693,847
Repairs	2,949,511	1,723,458
Taxes	7,434,181	5,944,164
Transferred to surplus	3,784,434	6,626,265
Dividends	2,358,000	
	$ 1,426,434	
Surplus July 1, 1918	9,947,829	
Net credit	482,724	
Total	$10,430,553	
Surplus June 30, 1919	11,856,987	

Purchase Terms Given

Details of the acquisition of the Spencer Wire Co., Worcester and Spencer, Mass., by the Clinton-Wright Wire Co., just made public show that the purchaser obtained the Spencer branch plant outright and the Worcester plant on an installment plan of payment under lease. The latter is to be paid for in 24 semiannual installments of $100,000 each, a total of $2,400,000. The property was appraised at $2,700,000.

In addition to this the purchaser will pay the Spencer Wire Co. an annual rental of $142,375, making the total annual payment $342,375. The total received for the Worcester plant when the final cash payment is made will be $4,108,500. What was paid for the Spencer branch is not made public, though it was appraised at $620,000.

National Acme Gross Falls

Gross sales of the National Acme Co., Cleveland, for the eight months ending Aug. 31 were $7,677,856 as compared with $10,039,082 for the same period the previous year. Profits exclusive of excess profits and capital stock taxes were $2,097,103 as compared with $3,785,822. Although these figures show a decrease for the first eight months of this year as compared with 1918 it is possible that with the reduction of taxes, net earnings for the year will be as large as a year ago.

Production Cut

In Coal Tar Products by Strike—Supplies Are Allotted

New York, Sept. 29.—The steel strike has retarded the movement of benzol, toluol and solvent naphtha. Some sellers claim that production has been reduced to 25 per cent of normal, and these interests generally are using the utmost discretion in allotting tonnage. This condition, however, is expected to be only temporary. An improvement already is in evidence, and in some quarters normal operations are anticipated within a fortnight.

Quotations remain very firm at last week's levels. Pure benzol is quoted at 24 to 29 cents and 90 per cent at 24 to 28 cents. Toluol is holding at 25 to 30 cents and solvent naphtha at 22 to 27 cents. Naphthalin continues in heavy demand with virtually all sellers booked five to six weeks ahead. The dye manufacturers are possibly the largest buyers at this time, covering on large quantities of naphthalin flakes. Prices, however, are holding unchanged at 6½ to 7½ cents for naphthalin in flakes and 8½ to 9½ cents for naphthalin in balls.

Demand for sulphate of ammonia is still confined principally to exporters. The Japanese are said to be displaying quite a little interest at this time. However, no large tonnages are being bought, owing in a measure to the scarcity of spot material. No change is noted in quotations, contract ammonia holding at $3.25 to $3.40 and spot ammonia at $3.40 to $3.65. These prices are on a basis of f.o.b. producers' plants.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plant

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	3.40 to 3.65

Contract

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plant

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds Producers' Plants

Sulphate of ammonia	3.25 to 3.40

Obituaries

COL. HENRY A. MARTING, aged 69, pioneer iron manufacturer and philanthropist, of Ironton, O., died Sept. 27, following an illness of several months. Colonel Marting suffered for many years, an operation for bladder trouble becoming necessary in the fall of 1916. This gave him temporary relief; but he was compelled to give up active business a year ago. At that time he retired as general manager of the Marting Iron & Steel Co. He was succeeded by a nephew, E. O. Marting, in the active management of the business, although he still retained the presidency and acted as chairman of the board.

Colonel Marting's first venture of consequence on his own account in the iron business, which he had learned in his youth was the Marting Iron & Steel Co., which he organized in 1899 at Ironton, with two blast furnaces to manufacture bessemer, foundry, malleable and basic pig iron. In July, 1912, Col. Marting effected a merger of a number of furnace properties in the Hanging Rock district, by which his company absorbed the Ironton Iron Co., Ironton, and the Lawrence Iron Co., Culbertson, O. This acquisition gave the company a total of four furnaces. To the development of these properties he gave his active efforts up to the time of his enforced retirement, due to ill health, two years ago.

Colonel Marting was known as Ironton's "grand old man" for his many civic activities and his pride in his native city. A new up-to-date hotel, the Marting, completed a few months prior to his death, was one of his many achievements in the public interest in Ironton. Too ill to attend the formal dedication services, he was presented at this time a loving cup by a committee of citizens.

George L. Follansbee, formerly treasurer of the Follansbee Bros. Co., Pittsburgh, died Sept. 20, at Hendersonville, N. C., where he had been since March, 1918, on account of ill health. Before becoming identified with the Follansbee Bros. Co., Mr. Follansbee was in the printing business and also was Pittsburgh manager of the American Type Founders Co.

Harry Bonnell, aged 64, long identified with coal and iron interests in the Mahoning valley district, died Sept. 20, at Cambridge Springs, Pa. Mr. Bonnell was born in England and came to this country as a boy. He was identified with the Mahoning Valley Iron Co., Youngstown, O., in its office for many years and when the Republic Iron & Steel Co. took it over,

COL. H. A. MARTING

he became affiliated with the latter company. He retired several years ago.

Calls Foster an I. W. W.

(*Concluded from page* 917)

1000 South Paulina street, Chicago, wherein they advocated "direct action," and sabotage.

"Senators will please note," Senator Pomerene said, "that William Z. Foster, in his position as organizer of the steel men, seems to be following out the program so clearly set forth in his letter which I read. He is an I. W. W., as appears from the reading of his letter.

"With the feeling of unrest prevailing as it is today, for men of the type of Foster, who has no respect either for the law of God or the law of man, to be placed at the head of a labor organization, or a movement in the interest of labor, shocks one's reason. All that men of that kind can do or will do is to ruin the cause of labor."

Foster was also condemned by Representative Cooper, Youngstown, O., a member of the Brotherhood of Locomotive Engineers and a strong supporter of organized labor, whose remarks were loudly applauded. Foster was classed by Mr. Cooper with agitators who are attempting to push themselves tp positions of prominence in the American Federation of Labor.

"Many of these men," he asserted, "have not done an honest day's work in their lives and if reports are true they are stirring up a class hatred which will widen the gap between employer and employe instead of bringing them closer together."

Kahn Demands Palmer Prosecute Foster

Washington, Sept. 30.—In a conference with Attorney General Palmer last Wednesday, Representative Julius Kahn, California, chairman of the house committee on military affairs, urged federal prosecution of William Z. Foster on the grounds that he is inciting revolution in the United States. This was while senators and representatives were denouncing Foster as an enemy of the government.

Mr. Kahn said he was assured the department of justice has complete records of Foster's activities in the past and that his work in the steel strike is under observation. He declined to say whether the attorney general contemplated any federal action against Foster.

The demand for prosecution, Representative Kahn said, was based on Foster's pamphlet of "Syndicalism," a copy of which Mr. Kahn placed before the attorney general.

"Mr. Foster's writings clearly show that he advocates murder, the destruction of property and a general strike, all for the purpose of enforcing his views on the country," Mr. Kahn said. "There is little doubt but that he favors the establishment of a soviet government in the United States, and advocates strike after strike until the workers have practically confiscated the properties where they are employed

"In my mind, Mr. Foster's radical writings are responsible for the recent killings in the steel district. I suggested to Mr. Palmer that Foster should be charged with being 'an accessory before the fact.' Mr. Palmer replied if such were the case it would be a matter for the state to prosecute and not the federal government."

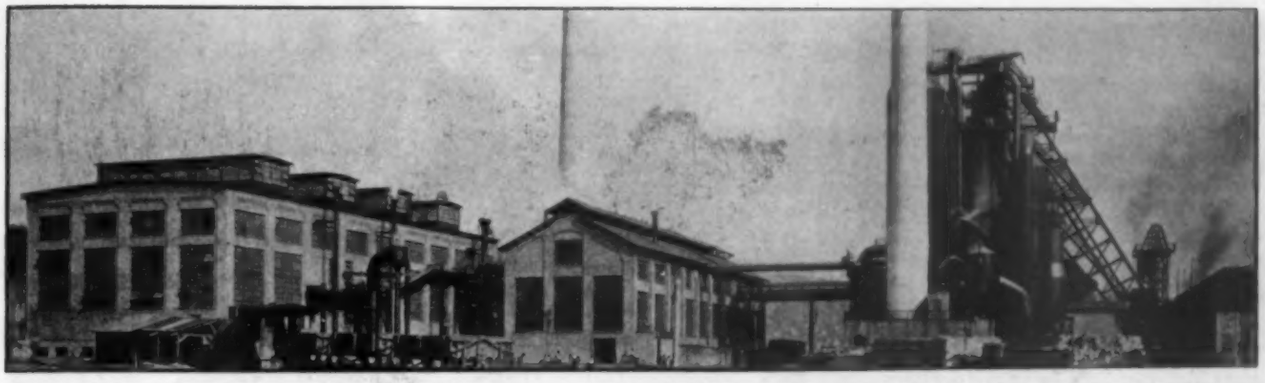


Fig. 1—The ground upon which the blast furnace of the Weirton Steel Co. is located adjoins the Chester branch of the Pennsylvania railroad near the main line between Pittsburgh and Steubenville, O. The Ohio river forms the north boundary of the plant, the general yard level being 88 feet above the river

Wierton Steel Builds Modern Furnace

WEST VIRGINIA'S fifth blast furnace, the first to be erected outside of the Wheeling-Benwood district. recently was put in operation at Weirton by the Weirton Steel Co. Ground was broken July 22, 1918, and in 364 days or July 21, 1919, the furnace was lighted and the blast put on. The output at present is being marketed but when the company's new steel plant, which will include seven open-hearth furnaces and a 40-inch blooming mill, is completed, the product of the furnace will be used by the company.

The furnace was designed by Freyn, Brassert & Co., Chicago, in conjunction with the engineering department of the Weirton Steel Co. and was erected by J. J. Mohr & Son, Chicago. The stack, which is rated at 600 tons capacity, is 22½ x 92 feet. Ten cast-iron columns support the furnace proper. Hot blast is supplied through ten tuyeres which are so situated in the bosh that a tuyere is centered between every two columns. This arrangement affords plenty of freedom to the furnacemen when charging tuyeres, coolers or blowpipes and presents a neat appearance. The furnace at present is being blown with eight 12 x 6-inch and two 15 x 5-inch tuyeres, one of the latter size tuyeres being placed over the iron notch for the purpose of maintaining a long hole. The other 15 x 5-inch tuyere is placed 180 degrees from the iron notch in order to equalize the blast penetration of the same size tuyere in the front of the furnace.

All tuyeres and bosh plates are supplied with water from a manifold which encircles the furnace at a point about 2 feet above the bustle pipe. This manifold is supplied with water through two feed pipes each of which is equipped with an Elliott-type basket strainer. All valves for controlling the amount of water fed to the tuyeres and bosh plates are screwed into the manifold at the side opposite the furnace and are handy for the watertender to operate. The water after passing through the tuyeres and bosh plates is discharged into a cast-iron trough which also encircles the furnace just

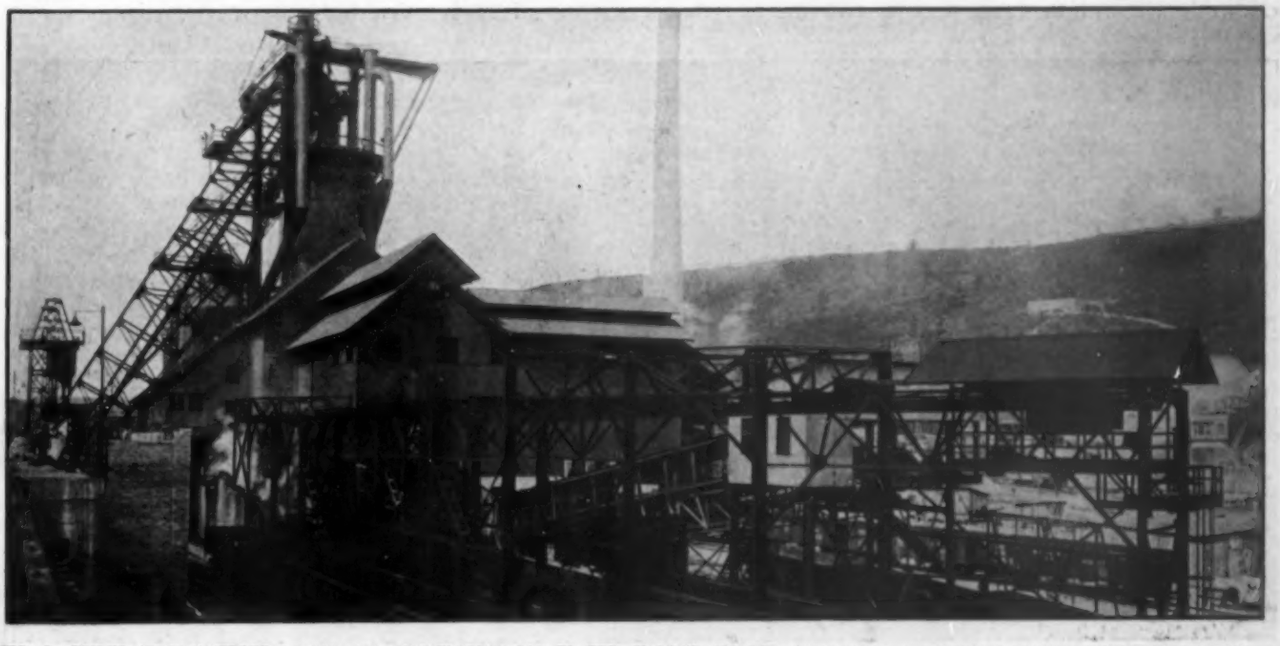


FIG. 2—CINDER IS TRANSFERRED FROM THE GRANULATING PIT TO THE VARIOUS HOPPER CARS BY A CLAM-SHELL BUCKET SUSPENDED FROM A MONORAIL CRANE. THE LATTER IS ALSO USED FOR CONVEYING MATERIAL SUCH AS COKE DUST, CLAY, SAND, ETC., FROM OUTSIDE STORAGE BINS TO THE CAST-HOUSE FLOOR

FIG. 3—4800 BOILER HORSEPOWER IS PROVIDED BY ONE COAL-FIRED AND SEVEN GAS-FIRED, THREE-PASS BOILERS WHICH ARE BUILT FOR 231 POUNDS PRESSURE AND 125 DEGREES SUPERHEAT

above the manifold. On all manifold valves and on all pipes discharging into the trough are attached perforated steel plates which indicate the number of the tuyeres, the coolers and the bosh plates respectively. By means of this arrangement there is no excuse for the watertender turning the wrong valve when it is necessary to shut off the water from any particular tuyere, cooler or bosh plate. A trough is provided around the furnace shell at the extreme top of the bosh so that if it becomes necessary to install sprays around the shell should a hot spot develop, the discharge water will be taken care of properly without dripping down on the furnace floor.

A Killeen-type skimmer separates the slag from the iron during the cast, the iron flowing into 75-ton ladles placed at the end of the cast house and the slag into a granulating pit. Two ladles are provided. These rest on standards with the pouring lips facing each other. The ladles are tilted separately by means of a 55-ton traveling crane, the metal flowing into a trough which discharges into the individual molds of a pig machine. The usual splashing of metal during the pouring process is absent at this plant owing to the fact that a distance of about 24 inches is maintained between the receiving trough and the pouring lip on the ladle. The pig machine is of the Uhling two-strand type and was built by the Pittsburgh Coal Washer Co., Pittsburgh.

The slag is granulated in a concrete pit which is built inside the cinder-yard runway. Provision, however, has been made for flushing the slag into ladles whenever it becomes necessary. The slag is transferred from the granulating pit to railroad hopper cars by means of a grab bucket suspended from a monorail crane. The loading equipment was built by the Pawling & Harnischfeger Co., Milwaukee. Adjoining the cin-

FIG. 4—EACH STOVE IS EQUIPPED WITH TWO CHIMNEY VALVES WHICH CONNECT WITH AN UNDERGROUND FLUE LEADING TO A 9½ x 225-FOOT CONCRETE CHIMNEY

der-yard runway is a yard equipped with several bins for storing sand, clay, coke dust, etc., for furnace use. These materials are transferred to the furnace floor by means of the cinder-yard crane which is switched onto a monorail built over the storage bins and extending into the cast house.

After the iron has been cast from the furnace the iron notch is plugged with clay by means of a Brosius-type steam gun, the operation of which is controlled by a single workman stationed to one side. The operator by manipulating four steam valves raises the splasher plate, swings the clay gun into the iron notch, brings the dogs down on the yokes of the clay gun and forces the gun load of clay into the hole. After additional clay is forced into the iron notch, the furnace foreman by means of electric signaling system notifies the blowing engineer to deliver the normal quantity of blast. The blowing engineer acknowledges this order by pressing a button which causes an electric horn, installed at the furnace, to blow. A telephone system is being installed between the engine room and the furnace for use in case the electric-signal system should fail at any time. The furnace may be rodded, that is, the height of the stock may be determined, either from the stockhouse or the furnace floor.

Handling of Raw Materials

At the northeastern end of the plant, the stove foundation, trestle and gas mains have been built so that whenever conditions warrant, additional furnaces can be built without disturbing the operation of the present one. Ore, coke and limestone are brought up over the trestle, which supports three railroad tracks. Coke and limestone are dumped directly into bins while the ore either is dumped directly into the various bins or is stocked in piles near the trestle. The stocking is done by means of two yard cranes each of which are equipped with a 40 cubic-foot grab bucket. The cranes were built by the Brown Hoisting Machinery Co., Cleveland. They are also used for charging ore from the stock piles into the bins directly or loading a 50-ton, electrically-operated, transfer car which distributes the ore to the respective bins.

Sixteen bins are provided. They are all built of concrete with the exception of the coke bin which is built of heavy boiler plates securely riveted together. Ten bins are set aside for storing ore, four for limestone, one for scrap and one for coke. The ore bins are lined with wood, the limestone bins with cast-iron plates and the scrap bin with steel rails. Ore and limestone are transferred from the bins to the skips by means of an electrically-driven scale car equipped with a dial recorder. Two cars are provided, one being set aside as a spare. They were built by the Atlas Car & Mfg. Co., Cleveland. Each is of 100 cubic-foot capacity.

The coke bin which is built over the skip pit, is provided with two chutes, one for each skip. The slide

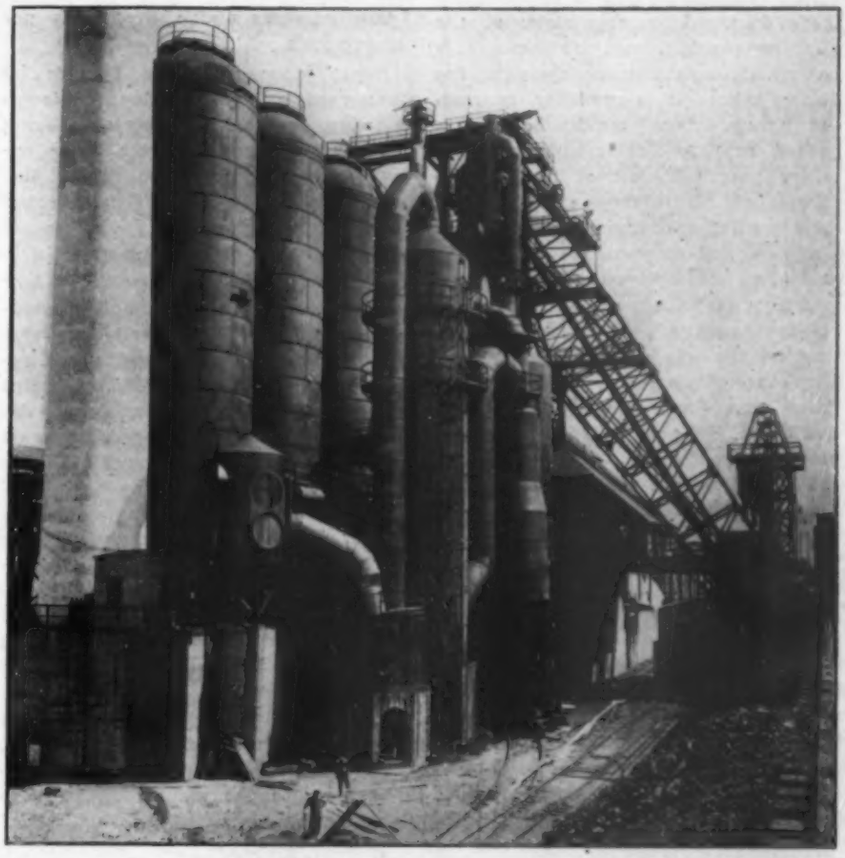


FIG. 5—VIEW FROM THE TRESTLE SHOWING THE GAS-CLEANING SYSTEM; SELF-SUPPORTING, CANTILEVER-TYPE, DOUBLE-TRACK SKIP BRIDGE; AND AUTOMATIC COKE-BREEZE SKIP STRUCTURE AND OVERHEAD HOPPERS

of each chute is arranged with four cascade-type screens, each having a series of 1¼-inch slots placed in a staggard position. The coke-bin doors are operated by means of compressed air. When coke is being charged into the skip, the breeze passing through the screen falls into a hopper underneath. This hopper discharges into a skip which elevates and discharges the breeze into a comman receiving hopper near the top of the trestle. The discharge door of the hopper underneath the coke-bin chutes is closed automatically by the skip when it begins its upward travel and is opened automatically when the skip returns for its load. The breeze from the common hopper is discharged over chutes into railroad hopper cars for steel-plant or furnace use. The coke-breeze elevating and storing system was built by the De Pere Mfg. Co., De Pere, Wis.

Stock is elevated to the top of the furnace in skip cars which are operated by means of a hoisting engine built by the Lidgerwood Mfg. Co., New York. The drums, around which the skip cables wind, are connected through reduction gears to a single 200-horsepower Westinghouse motor. The skip-control equipment was built by the Cutler-Hammer Mfg. Co., Milwaukee. The skip engine is housed in a building directly under the skip bridge. The furnace top is of the stationary type. The double-bell system is used for dropping the charge into the furnace. Both bells are kept closed by means of counterweights located in the skip-engine house and are opened by means of compressed air taken from the cold-blast main. If it is desired to open the bells while the blast is off the furnace, compressed air from another source cuts in automatically.

Outrigger beams have been built on top the furnace and are used for dismantling the top prior to relining the furnace. The gas passes out of

the furnace through four offtake pipes arranged 90 degrees apart. These offtake pipes combine into four uptake pipes, two of which are surmounted by Baer-type safety valves for the purpose of reducing the amount of stock thrown out of the furnace during a slip. Near the top of the offtake pipes are individual downcomer pipes, each two of which converge into one pipe.

The gas enters a secondary dust catcher tangentially where it is subjected to a whirling motion. This action relieves the gas of considerable more dust. After this stage of the cleaning process, part of the gas is passed through a large main to the boilers where it is used for generating steam. The remaining gas is passed into a Brassert-type washer where practically all of the dust is eliminated. It is then passed into a drier which extracts considerable moisture and entrained water. The gas mains connecting the dust catcher, whirler, gas washer and drier are equipped with goggle valves for shutting off the gas when necessary and with safety platforms near all elevated steam and water valves.

Three, 2-pass, side-combustion stoves serve the furnace. The checkers in each stove are 3½ inches square and together with the combustion chamber brick offer 95,000 square feet of heating surface. Each stove is 22 x 100 feet and is equipped with a Birkholtz-Terbeck gas burner and a Mathesius-type hot-blast valve. A 4-inch pipe is tapped into the head of the stove gas main near the furnace, and, by an arrangement of valves, is used either as a washout line or as an outlet for gas which is to be used for drying newly-lined ladles. The products of combustion leave the stove through two doors, pass through a tunnel to a 225-foot concrete chimney and are exhausted into the air. The snort valve and all stove blow-off valves are connected to the chimney. By means of this arrangement, the roar, which is noticeable at many furnaces when a stove is taken off the furnace to be put on gas or when the blast is emitted through the snort valve, is dispensed with. The cold-blast main is equipped with a relief valve which opens automatically when the pressure of the blast increases above 25 pounds per square inch.

Blast is supplied the furnace by means of a cross-compound, steam-blowing engine, a similar unit being held in reserve as a spare. The engines were built by the Mesta Machine Co., Pittsburgh. The average operating speed at present is from 75 to 80 revolutions per minute.

The power-house is built of buff brick and houses the pumping equipment and one 7500-kilowatt generator which was built by the General Electric Co., Schenectady, N. Y. The generator is driven by a Curtis-type steam turbine. The power house is served by a 20-ton crane built by the Champion Engineering Co., Kenton, O. Steam is supplied to the power house at 225 pounds pressure per square inch and 100 degrees superheat by eight 603-horsepower boilers, seven of which are gas-fired and one stoker-fired. The stoker-type unit is equipped with a burner built by the Combustion Engineering Corp., New York. All units are equipped with superheaters and soot blowers. The products of combustion are exhausted into the air through a concrete stack 225 feet high. Along the charging side of the boiler house are coal bunkers which are charged from outside the building by means of a yard crane and clam-shell bucket.

Serving the boilers is a water-softener plant which performs three functions, namely, softening, heating and filtering the water prior to its use in the boilers. This equipment was built by the William Graver Tank Works, East Chicago, Ind. All water used at the plant is taken from the Ohio river and is pumped through a 30-inch pipe into a Westinghouse barometric condenser built just outside the power-house building. This condenser operates in conjunction with the turbo generator and uses 8500 gallons of water per minute. The discharge water from this condenser flows into a cistern which has a holding capacity of 200,000 gallons of water. The reservoir is located in the basement of the power-house building. Water is pumped from here to the furnace for use in the cooling system and for cleaning purposes in the gas washer. Another pump supplies the blowing-engine condenser. The discharge water from this unit passes into a hot well and is pumped to the boilers department for steam generation and to the furnace for washup lines and the granulating pit. An 18-inch auxiliary supply pipe also connects the river with the cistern indirectly.

Officials of the Weirton Steel Co. include E. T. Weir, president; J. C. Williams, vice president and general manager, and D. M. Weir, vice president and secretary. C. H. Elliott is steel works manager, and H. E. McDonnell is blast furnace superintendent.

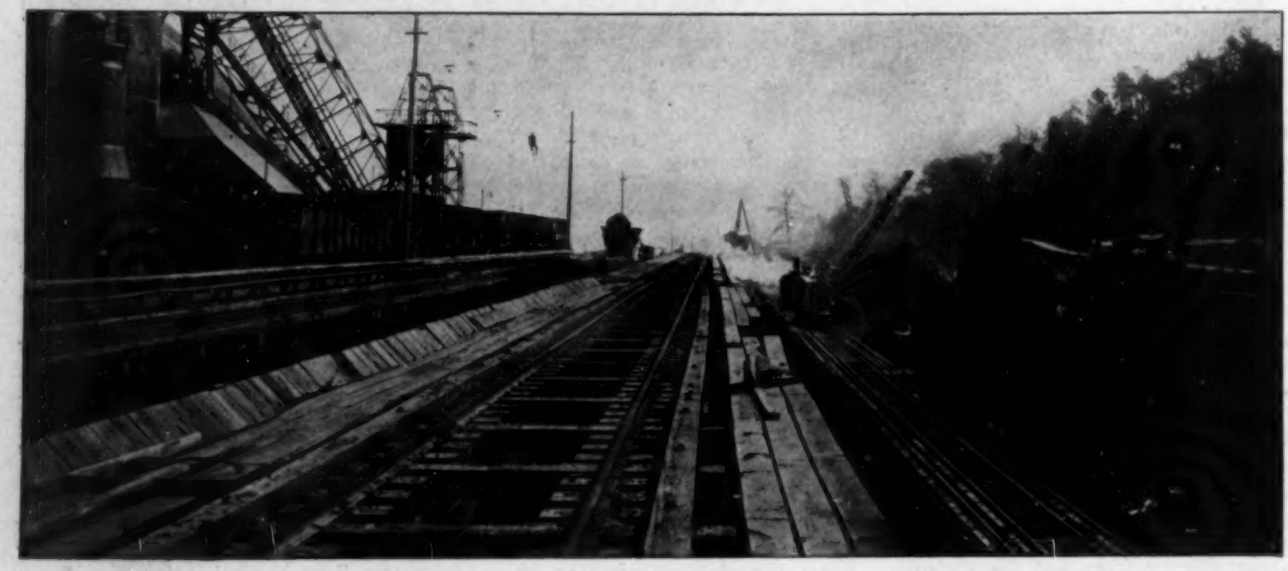


FIG. 6—PROVISION HAS BEEN MADE FOR INSTALLING AN ORE BRIDGE AND CAR DUMPER. AT PRESENT THE ORE IS STOCKED OR RECLAIMED BY TWO LOCOMOTIVE CRANES EQUIPPED WITH OUTRIGGER WHEELS AND 2-CUBIC YARD BUCKETS

Heat Treaters Hold First Meeting

Initial National Gathering and Exhibit at Chicago Brings Liberal Response From Metallurgists and Manufacturers—Many Papers Presented at Technical Sessions — General Officers Elected for One and Two Year Terms

FORMED one year ago in Chicago and in the interval having established nine chapters in the larger centers of the steel industry with more than 1000 members, the American Steel Treaters' society held its first convention and trade exhibition at Chicago, Sept. 23 to 27. The attendance reached practically 1000 daily at the exhibition and an average of 150 at the technical sessions.

Sixty-four exhibits were displayed in the Seventh Regiment armory by manufacturers of special steels, heating furnaces, alloys, supplies and apparatus essential to this branch of the steel industry. Among the exhibitors were the Crucible Steel Co. of America, the Chicago Flexible Shaft Co., maker of heating furnaces, the Interstate Iron & Steel Co., which recently entered the alloy field, the Ludlum Steel Co., P. H. & F. M. Roots Co., Joseph T. Ryerson & Son, the Vanadium Alloys Steel Co., Colonial Steel Co., Denver Fire Clay Co., Firth-Sterling Steel Co., Mahr Mfg. Co. and Swedish Crucible Steel Co.

Warns of Strike Dangers

H. H. Merrick, president of the Chicago Association of Commerce, gave the address of welcome and warned of the danger of the present era of strikes and the consequent loss of production. He said: "Somehow we must stop this talk of strike—the idea that a few men can tie up a great industry, that one man can justify himself in saying that the strike of the steel and iron workers is simply a warning that the American Federation of Labor may demonstrate that it has the power to strike. That sort of thing is absolutely wrong in this country. There may be evils in the trade, conditions among laboring men that require attention and adjustment. There may be such conditions in your own plant but all the world needs production today and we are the primary factor in production. In reality the trouble that brings about these strikes is occasioned by the agitator, the man who doesn't work, who hasn't worked for years and who doesn't intend to work in the future. Then, again, there is the weak-kneed sister who yields to every current of the wind, as in the case of the Adamson law, 'let's give up this and tomorrow give up that and next week let's surrender that.' Out of that comes disaster and chaos."

The election of officers resulted in choice of men from various sections of the country, half being chosen for one year and the remainder for two years, to give an alternation in elections in the future. T. E. Barker, production manager of the Miehle Printing Press & Mfg. Co., Chicago, was chosen president for one year. E. J. Janitzky, metallurgical engineer of the Illinois Steel Co., Chicago, was made first vice president for two years and D. K. Bullens, consulting metallurgist, Cann & Saul, Royersford, Pa., second vice president for one year. Arthur G. Henry, metallurgist for the Illinois Tool Works, Chicago, was re-elected secretary for two years. Directors for two years are H. G. Wiedenthal, vice president of James H. Herron Co., Cleveland, and A. F. McFarland, metallurgist for the Vanadium-Alloys Steel Co., Latrobe, Pa. Directors for one year are J. Fletcher Harper, Allis-Chalmers Mfg. Co., Milwaukee, and J. O. Pollak, secretary Pollak Steel Co., Cincinnati.

The technical sessions brought out a large number of papers on various phases of heat treating for various purposes, temperatures, design, selection of steels, failures, annealing, fuel economy and pyrometry.

Thursday evening the sessions closed with a banquet and entertainment at which addresses were made by John W. O'Leary, of Chicago, counsellor of the United States Chamber of Commerce; Dr. Henry Marion Howe, dean of American metallurgists, and Joseph W. Richards, professor of metallurgy of Lehigh university. Dr. Howe was present at all the sessions of the society and aided much by his discussions.

As an added feature, giving practical application of heat treating methods, a number of Chicago companies arranged for those in attendance at the meetings to visit their plants. This gave the opportunity to the various members of the society to observe different practice and the application of new principles as worked out by various institutions carrying on heat treating work in a commercial way.

During the meeting more than 100 additional members were enrolled and applications were made for instituting several additional chapters in centers of steel working industries.

Sheet Extensions Let

Contracts for the new extensions of the company's capacity for the production of highly finished specialty sheets have been awarded by the American Rolling Mill Co., Middletown, O., to the Westinghouse, Church, Kerr & Co., Inc., New York City. This contract covers the building and part of the equipment. The balance of the equipment also has been contracted for. It is expected that the output of the new mills will be ready for the market during the second quarter of 1920. The increase in the capital stock of the company by $20,000,000 par value of 7 per cent debenture preferred stock as recommended by the directors, which was approved by the stockholders at a recent meeting, is to cover the cost of the increased capacity and to provide additional working capital. This stock has been offered to the common stockholders at par and to the public through Cincinnati and New York bankers. The common stockholders of record Aug. 19 are offered 10,000 shares of the present common stock at $25 par value per share in the ratio of one new share for each four shares held on that date. It is expected that the rights to the common stock will be taken up by the stockholders and that a large proportion of the preferred stock will be disposed of in a similar manner.

Steel Suit Scheduled

Washington, Sept. 23.—The government dissolution suit against the United States Steel Corp. has been scheduled as the sixth case in the new docket to come before the October term of the Supreme court for argument and perhaps will be heard about the latter part of that month. No new brief is to be presented by the department of justice, it is said, whose chief argument will be made by Judge Ames, who succeeded G. Carroll Tod as assistant attorney general.

Engineers Convene at St. Louis

Association of Iron and Steel Electrical Engineers Holds Thirteenth Annual Convention—Electrical Problems of Vital Interest to the Iron and Steel Industry Discussed—Future Calls for Solution of These Problems

ALTHOUGH but 30 years have elapsed since the first electric installation was made in a steel mill, the importance of this form of motive power was evidenced at the thirteenth annual convention of the Association of Iron and Steel Electrical Engineers, held in St. Louis, Sept. 23 to 26. Interest was shown not only in the papers which were presented but also in the display of electrical apparatus, inaugurated at the St. Louis convention.

"The keynote of the Association of Iron and Steel Electrical Engineers," said D. M. Petty, retiring president at the annual banquet, "is co-operation. The object of this association is the advancement of the application of electricity to the iron, steel and allied industries by the co-operation of its members. The means that have been employed to attain this end are the presentation and discussion of technical papers in section meetings.

"Sections have been formed in Birmingham, Ala., Chicago, Cleveland, Philadelphia and Pittsburgh. One of the great advantages of these section meetings is that foremen and assistant superintendents, who cannot go to the annual conventions, can easily attend these meetings. The good ideas that these men carry back to their plants tell in their daily work. Another means of furthering the art of electrical engineering is referred to as committee work. First is the educational committee, which has rendered several reports covering the training of electricians and the men in the mills who handle electrically operated apparatus; second is the electrical development committee which is on the lookout for new methods and apparatus of interest to the industry; third is the safety committee, which in 1912 became of such importance that from it the National Safety council was inaugurated; fourth is the electric furnace committee and fifth is the standardization committee, which has during the past few years made a strenuous effort to simplify the problems of spare parts for motors, controllers and similar devices.

"The third means by which the association advances the art is the bringing together of the men who are striving with the problems of increasing production, lowering costs and improving the quality of the plant product. The association must help the electrical engineer of the industry to do his work better. That we have not failed is shown by the remarkable growth of our organization."

Philip Stremmel, superintendent of the National Enameling & Stamping Co., Granite City, Ill., who during the past year conducted a school for safety engineers in connection with the St. Louis safety council, spoke on safety and the great advance it had made in the steel industry. He pointed out that the safety first movement was first instituted in steel mills. He stated that loyalty on the part of steel mill employes was largely due to their appreciation of the efforts made by mill operators to institute and maintain safety first work. Other speakers at the banquet were Senator Selden P. Spencer, B. W. Wilson, newly elected president of the association, Professor Karapetoff, Cornell university, Clarence Howard, president of the Commonwealth Steel Co., who presided as toastmaster, and Edgar Gagenbach, industrial commissioner of the St. Louis chamber of commerce.

Discusses Safety Problems

Proceedings of the opening session when officers were elected and official and committee reports received, were outlined on page 816 of THE IRON TRADE REVIEW for Sept. 25.

Discussion of the report of the safety and educational committee brought out the suggestion that safety should be considered before tonnage in all cases and that it is more practicable to teach men what to do than what not to do. One plan is to have foremen meet at frequent intervals to discuss accidents and to formulate means for avoiding them in the future.

A joint paper on "Organization of the Electrical Department in the Iron and Steel Industry" embraced the following subjects: Inspection and operation of electrical apparatus, by J. A. Morgan and J. J. Booth; educational training for electrical employes, by B. A. Cornwell; Electrical repair shops, by C. A. Menk; storeroom and spares, by T. E. Tynes, and records and tests by R. B. Gerhardt.

In the discussion that followed, the point was brought out that periodic tests should be made to see that insulation on important installations is efficient enough not to break down in practice and that these tests are not always carried out as often or as thoroughly as they should be. Because a motor has run for 10 years, it was stated, is no sign that it is in condition to run another 10 years. An actual breakdown test was strongly recommended in testing insulation as resistance tests do not always show if the insulation is adequate to withstand a maximum load. A good test was said to be 1¼ times the normal voltage.

Interest was shown in the discussion of two important subjects: The settling of disputes among the mill employes and automatic devices for calling important department heads who were away from their offices.

A personnel foreman, it was stated, is an advantage in hiring men. He is in close touch with the men and thus is in a position to gain their confidence. When a workman has a dispute with his foreman he can go to the personnel foreman and if these two heads cannot settle the difficulty, it is then taken to the general superintendent.

Professor Karbpetoff spoke on acoustic signals for calling department heads who are away from their offices. He has made an exhaustive study of such systems and predicts that in the near future they will be more generally used. He emphasized the difficulty of estimating the cost and trouble involved in cases where important executives cannot be readily reached. He cited a case of one steel mill executive who stated that a code calling system made the whole plant become his office. The various kinds of calls, whistles, bells, gongs, etc., that were used were explained. It was stated that in cases where high pitch sounds are in evidence, a low pitch call should be used and vice versa.

Professor Karbpetoff pointed out that such systems involve study and research work to adapt the necessary apparatus to different plants. Mistakes were often made, he said, because the sounds used were too loud, for while they must be audible they must not be discordant.

W. S. Hall, electrical engineer, South works, Illinois Steel Co., Chicago, presented a paper on "Alternating vs. Direct Current Motors for Rolling Mill Table Drives." This

paper set for that the adoption of alternating current motors for this class of drives would, in all probability, receive more attention in the future than it had in the past. The paper contained many interesting examples of both types of drive, together with cost figures in percentage for each type of installation. The illustrations described were for front roughing table, back roughing table, sheet bar mill roughing table and front mill table for a 132-inch mill. In the discussion, J. J. Ash stated that recent English installations involving both types of motors were giving excellent results.

H. D. James, control engineer for the Westinghouse Electric & Mfg. Co. read a paper on "Recent Improvements in Industrial Control." This paper described electric controllers of the magnetic contact type. He set forth that the electric controller has passed through the experimental stage so that at the present time it is reliable and well understood. It was stated that an exhaustive study of the design of magnetic controllers has enabled the engineer to make improvements which reduce the wear and maintenance costs and decrease the liability to freezing or failure to operate.

It was stated that considerable work has been done toward standardizing this form of equipment and that if steel mill requirements for controllers of this type were more uniform, manufacturers could build them in large quantities. This would give the purchaser better prices and quicker deliveries. This paper was illustrated by stereopticon slides.

"Present Status of Electrical Furnaces in the Steel Industry," was outlined by the electric furnace committee of the association. It was pointed out that electric steel production is divided into two classes, steel for ingots and steel for castings. The discussion developed that there is little technical literature available on electric furnace reactions. On the subject of furnace lining thicknesses, it was stated that too thin a lining wasted heat while an abnormally thick lining limited the capacity of the furnace. It was pointed out that careful records of furnace performances should be kept so that definite rules could be formulated.

That much of the success of any electric furnace depends on the operator himself was another point developed. The operators, it was stated, should be carefully trained. The shape of the furnace also came in for discussion. It was stated that the furnace body should be of such shape as to give equal heat at every point. The subject of electric heat treatment was covered in a paper by C. A. Winder, industrial heating engineer, General Electric Co., Schenectady, N. Y. It was claimed that furnaces of this type are economical in operation and that their further adoption is bound to come. The paper described three kinds of furnaces: Horizontal semicylindrical, car type and rotary conveyor type.

"Overload Protection for Motors" was discussed by Paul M. Lincoln. He described a type of recording meter for giving a continuous indication and record of the value of the average current through, and its heating effects on, the motor. The author is a consulting engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The discussion brought out that the device should help in the future design of motors, due to the fact that overloads at peak points are readily shown as the device gives an accurate check on the actual work accomplished. The meter furnished reliable data to determine just how different operators, working on different shifts, handled the same motor.

Gives Historical Sketch

Calvert Townley, president of the American Institute of Electrical Engineers, gave an interesting talk on the growth and development of electrical power as applied to the iron and steel industry. He pointed out that co-operation between the various electrical societies was necessary in deriving the greatest benefits.

A. G. Place, electrical engineer, Youngstown Sheet & Tube Co., Youngstown, O., read a paper on "Overhead Protection for Cranes." The paper dealt with the subject of protecting crane equipment from overloads and drew some interesting conclusions. In the discussion, it was brought out that protection devices should be made as "fool proof" as possible and that operators should be educated to the fact that protection devices should not be tampered with.

A paper illustrated with stereopticon slides and giving general specifications for alternating current motors for main roll drives, was presented by the standardization committee. The object of the specifications was to bring about a more uniform standard for motors of this type. The specifications represented a year's research on the part of the committee in charge.

Papers also were presented on "Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives," by J. E. Fries and a joint paper on "Present Status of Arc Welding in the Iron and Steel Industry," by A. Churchward, H. L. Unland, A. M. Bennett, R. A. Kinland, C. J. Holslag, R. M. Rush and A. M. Candy.

The exhibit was the first held by the electrical engineers and 34 manufacturers displayed electrical equipment. The displays were arranged in attractive booths adjacent to the convention hall. The following manufacturers took advantage of the opportunity to bring their products to the direct notice of the delegates: Edgar E. Brosius, Pittsburgh, single hoist charging machines; Keystone Lubricating Co., Philadelphia, greases; Benjamin Electric Mfg. Co., New York, lighting specialties; National Lamp Works of the General Electric Co., Schenectady, N. Y., light measuring devices; Reliance Electric & Engineering Co., Cleveland, generator sets; Thermoid Rubber Mfg. Co., Trenton, N. J., brake linings and friction disks; Marlin-Rockwell Corp., New Haven, Conn., asbestos insulated wire; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., industrial control apparatus; Trumbull Electric Mfg. Co., Plainville, Conn., externally operated switches; Chicago Fuse Mfg. Co., Chicago, fuses; Economy Fuse Mfg. Co., Chicago, fuses; National Carbon Co., Cleveland, electrodes, carbon brushes and dry cells; Iron & Steel Equipment Co., Pittsburgh, steel plant equipment; Electric Products Co., Cleveland, battery charging motor generators; Electric Controller & Mfg. Co., Cleveland, controllers; Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., crane hoists; Cutler-Hammer Mfg. Co., Milwaukee, magnetically operated brakes for direct control service; Delta Star Electric Co., Chicago, substation equipment; Bussman Mfg. Co., St. Louis, fuses; Ludwig Homel & Co., Cleveland and Pittsburgh, meters; General Devices & Fittings Co., Chicago, electrical fittings; General Electric Co., Schenectady, N. Y., solenoid brake motors; Automatic Reclosing Circuit Breaker Co., Columbus, O., current breakers; V. V. Fittings Co., Philadelphia, insulators and fittings; R. D. Nuttall Co., Pittsburgh, flexible couplings for generator and motor connections; Lakewood Engineering Co., Cleveland, industrial tractors; Crouse-Hinds Co., Syracuse, N. Y., electrical specialties; Tool Steel Gear & Pinion Co., Cincinnati, gears; Pittsburgh Transformer Co., Pittsburgh, transformers; Moloney Electric Co., Windsor, Ont., transformers; Wilson Welder & Metals Co., New York, portable electric welding apparatus; Wood & Lane Co., St. Louis, fuses; Volk Mfg. Co., Westport, Conn., fuses.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Chain Belt Co., Milwaukee, has announced plans for an important plant enlargement and improvement program, for which purpose the capital stock has been increased from $1,000,000 to $2,800,000. About two years ago the company purchased a 23-acre site in West Milwaukee, the limit of expansion at the original location having been reached. Contracts have been awarded for the first unit, 160 x 316 feet, which temporarily will be used as a concrete mixer assembling shop but will be converted into a foundry after a third unit has been provided early in 1920. The structural steel, amounting to 500 tons will be fabricated and erected by the Milwaukee Structural Steel Co. One 15-ton and two 5-ton electric cranes will be purchased in addition to other equipment.

The business now known as the Chain Belt Co., was started by C. W. Levalley in 1891 with a capital of $11,100. Capital stock was increased to $50,000 in October, 1895; to $500,000 in 1907 and to $1,000,000 in 1916. It commenced operations in a small shop. Subsequently larger quarters were secured. The present site was first occupied in 1902 when what now is the office building was erected. Since then additional buildings have been added until the entire site has been covered. In 1906 Mr. Levalley organized the Levalley Mfg. Co., later absorbed by the Chain Belt Co., as its gray iron department. A malleable iron foundry, 80 x 506 feet, was acquired in 1912 by purchase from the Prescott Malleable Iron Co., and since has been considerably enlarged.

Prior to his death in 1918, at the age of 84, Mr. Levalley was chairman of the board having served as the company's president until retiring in 1916. William C. Frye now is president; C. R. Messinger, vice president and, general manager; W. C. Sargent, secretary, and C. L. Pfeiffer is treasurer. Donald Fraser, who was vice president for many years, now is consulting engineer.

* * *

ANNOUNCEMENT has been made that the American Car & Foundry Co. will build a plant in Chicago to cost between $1,000,000 and $2,000,000, to be devoted to the manufacture of steel cars. The building is to be completed within six months, according to present plans.

* * *

STEEL for the new 4-story factory addition of the Hoover Suction Sweeper Co., North Canton, O., has been awarded to the Canton Bridge Co., Canton.

* * *

THE Barnes & Kobert Mfg. Co., manufacturer of bolts, which removed from Milldale, Conn., to New Britain, Conn., four years ago, has purchased the factory building it occupies.

* * *

WITH a complete line of mill supplies, an office and warehouse has been established at 197 High street, Boston, by the Boston Pulley & Shafting Co., a newly organized company. It is in charge of T. E. Toomey.

* * *

CONTRACTS have been awarded to the McLain-Carter Furnace Co., Milwaukee, for the installation of a 10-ton open-hearth furnace in the plant of the Black Steel & Wire Co., Kansas City, Mo.

* * *

ANNOUNCEMENT is made by the Wald Mfg. Co., Sheboygan, Wis., automobile parts and accessories, that it has increased its capital stock from $30,000 to $90,000. It will erect an addition to its factory to double its output.

* * *

EARLY in October, the Interstate Aluminum Co., Canton, O., expects to operate in a plant, 60 x 100 feet. The company recently was incorporated by Theodore Dobs and Robert Efflinger, that city, and Paul Barnard, J. W. Fenstermaker and W. Doolittle, of Massillon, O.

* * *

PLANT and equipment of the Loucks Iron & Steel Co., Roanoke, Va., recently were purchased by the Barr Co., Pittsburgh. The latter has begun work on dismantling the plant and selling the machinery and scrap. Equipment for a finishing mill, puddle mill, machine shop and pump house is included in the purchase.

* * *

WORK on construction of a $300,000 addition to the plant of the Kansas City Structural Steel Co., Kansas City, has been started. The addition will increase the capacity of the plant 50 per cent and is expected to be in operation before the close of the year.

* * *

THE Giant Truck Corp. has bought the plant of the Chicago Pneumatic Tool Co., at Chicago Heights, Ill., and will utilize it in the manufacture of Giant trucks and motor cars. The former owners have removed its equipment to their Cleveland plant.

* * *

TO CARRY on a general business in iron, steel and metal scrap, the Commercial Steel & Supply Co. has been organized in Cleveland by A. A. Murfey and W. H. Dickey, formerly associated with the Ferrel-Dangler-Wilson Co., that city. The office of the new company is located in the Garfield building.

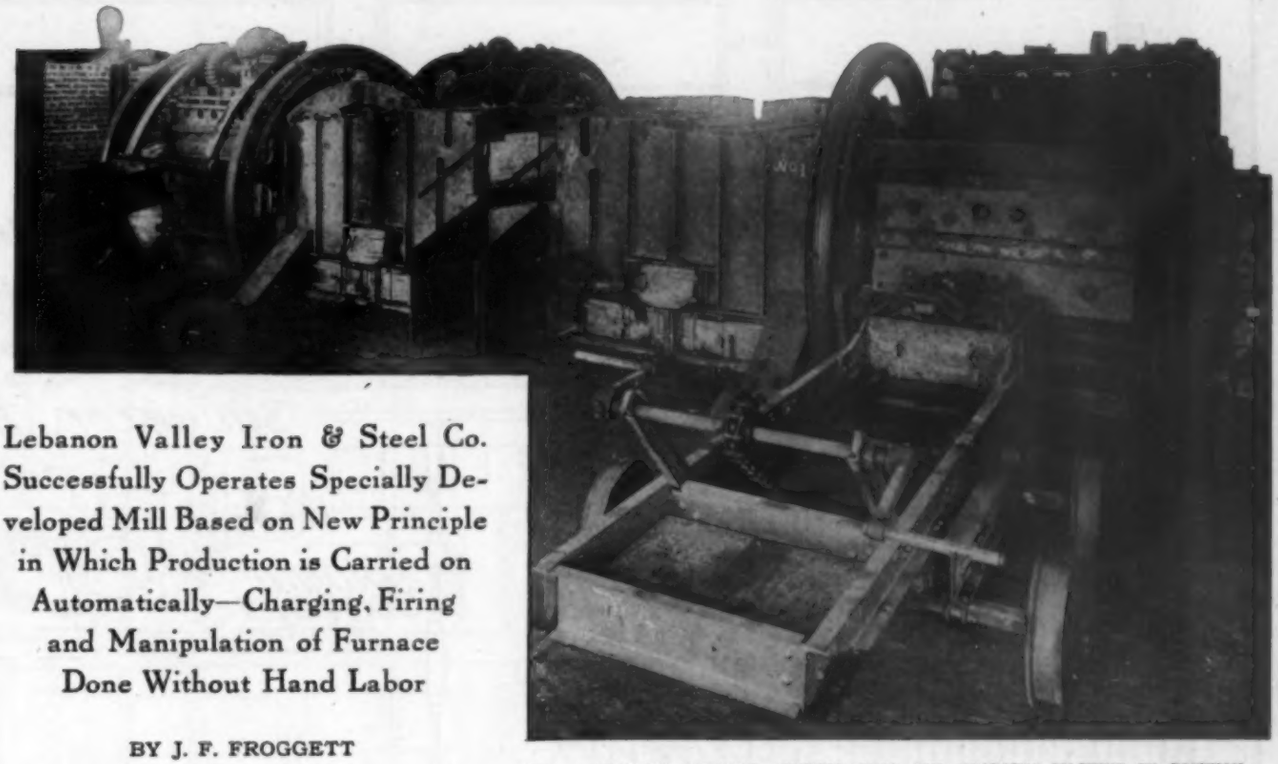
* * *

AT A COST of $3500 the Mt. Vernon Foundry Co., Mt. Vernon, O., has purchased a site for a new building from the Mt. Vernon chamber of commerce. A $20,000 building is contemplated and the Mt. Vernon Foundry Co. is to be reimbursed for the purchase price in three payments.

* * *

THE Uniform Co., Boston, recently was merged with the Blaw-Knox Co., Pittsburgh. The former company was organized to develop the general use of the system of concrete floor and roof construction designed by Nils F. Ambursen, formerly engineer of the Ambursen Hydraulic Construction Co. Mr. Ambursen now is chief engineer of the building forms department of the combined companies and W. L. Church, formerly of Westinghouse, Church, Kerr & Co., who has been associated with Mr. Ambursen for several years, is consulting engineer.

Making Bar Iron Mechanically



Lebanon Valley Iron & Steel Co. Successfully Operates Specially Developed Mill Based on New Principle in Which Production is Carried on Automatically—Charging, Firing and Manipulation of Furnace Done Without Hand Labor

BY J. F. FROGGETT

FIG. 1—ROTATING FURNACE SHOWING DOOR AND CHARGING MACHINE IN POSITION

YEARS of patient study, exercise of considerable ingenuity and expenditure of much treasure have been devoted to the problem of automatic production and finishing of iron and steel. The attainment of this end has been reached by the Lebanon Valley Iron & Steel Co., Lebanon, Pa., in the new wrought iron mill which it placed in active operation on Sept. 11. The company itself would be the first to disclaim having solved all the problems connected with automatic production of bar iron, but the success that has attended its efforts so far augurs well for future developments. It now is actually producing automatically and rolling with the least employment of hand labor muck bar and billets for the trade. The new mill is working smoothly and is bound to be a most important factor in the eastern bar iron industry because of the economies effected in manufacture of this product.

By some the Lebanon mill is denominated an automatic puddling mill, but this is not strictly correct since no attempt has yet been made to puddle pig iron in it. This likely will be attempted at some future time. So far, the mill may be described broadly as an automatic busheling mill. Scrap is employed, even the charging of the rotating furnace, firing and manipulation being done by the latest machinery of which some was invented and built by the Lebanon company itself. While the rolls are manned by hand roughers, yet electrically-driven machinery is employed everywhere to facilitate and supplement roughing by hand with the least expenditure of muscle and utmost relief from physical strain upon the workmen.

On Horizontal Axis Principle

Heretofore, efforts of inventors had been directed toward producing a mechanical puddler based upon the principle of a vertical axis for the rotating furnace. But this Lebanon furnace, invented and patented by Walter C. Ely, treasurer and general manager of the Highland Iron & Steel Co., Terre Haute, Ind., is based upon the principle of a horizontal axis which permits continuous process of further manufacture by means of machinery without a stop or radical change in direction of the moving unfinished product.

The main feature of the Lebanon company's theory in building the mill was to insure automatic operation of the furnace which heats the charge to welding temperature. The application of the principle of rotation to the furnace was not new except in its method of rotation as pointed out above. But the invention of the door of the furnace and its principle of opening and closing by means of an individual 15 horsepower motor attached to and revolving with the furnace itself was the ingenious feature. For by merely shifting this door, the ball of wrought iron is dropped upon a conveyor belt which moves it rapidly to the squeezers whence it is conveyed by another belt to the muck mill and the end of the bloom inserted into the rolls for the first pass.

Each of the eight rotating furnaces installed in the Lebanon plant is 7 feet long, outside measurement, 6 feet 4 inches in diameter overall. In general appearance it gives one the impression of an octagonal tumbling barrel such as is employed in cleaning castings in a foundry. The exterior of the furnace is constructed of cast-iron chills and the lining is composed of 9-inch standard magnesite bricks which at first required some dexterity to lay so they would hug the interior of the furnace. The firebox which feeds the furnace is not at all unlike the firing end of an ordinary reverberatory furnace, the hot gases passing over through a bricked flue into the revolving chamber and thence through another bricked flue into the waste gas chamber to a 250-horsepower Wickes water tube boiler thence through a stack 48

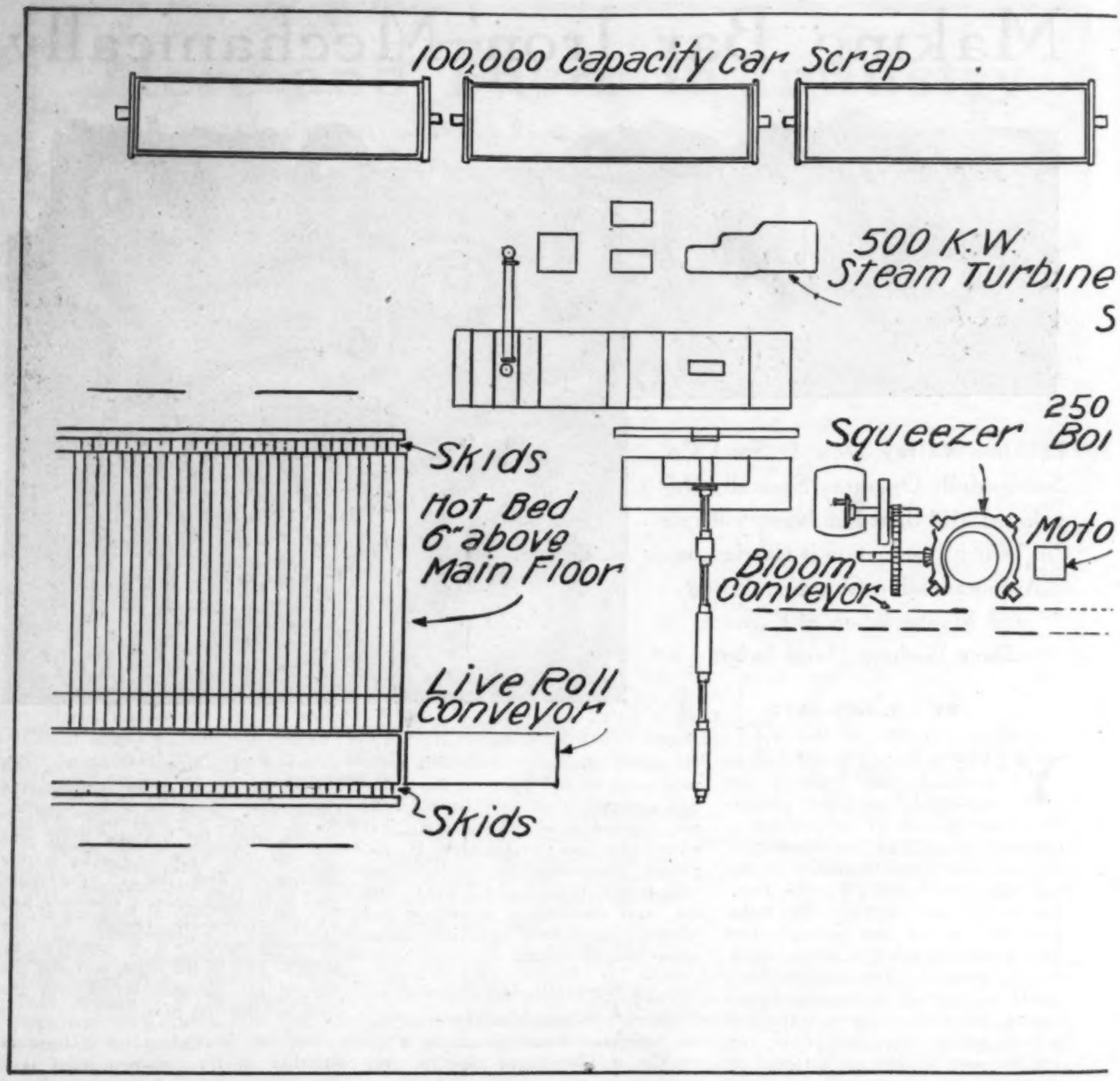
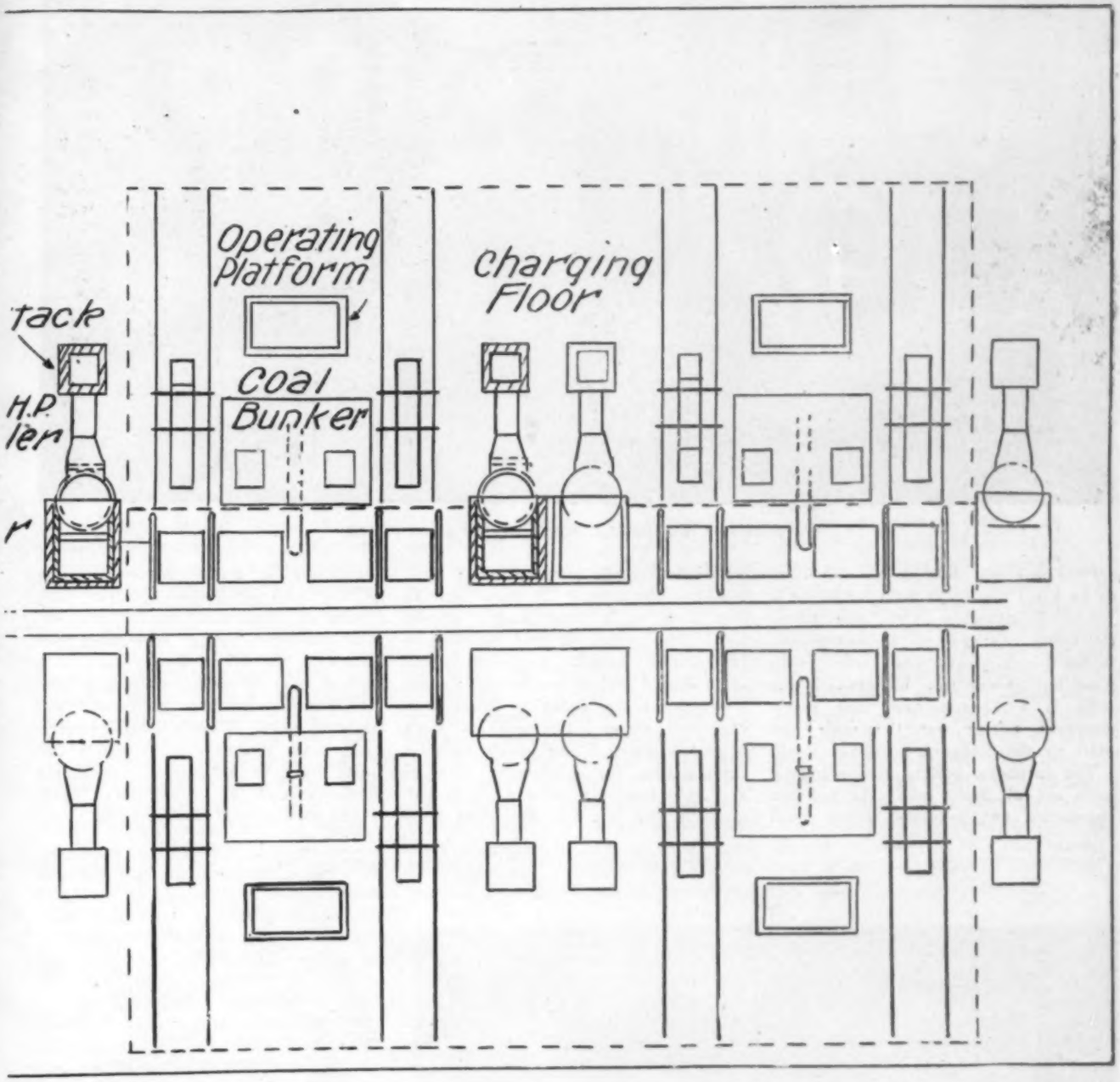


FIG. 2—LAYOUT OF NEW ROTATING FURNACES AND MUCK

inches in diameter and 110 feet high. Eight of these boilers attached to the eight furnaces furnish steam for the mill engines and turbine. The rotating furnace is mounted upon two 10-foot cast steel wheels or carrying rings propelled by two motor-driven 14-inch friction rolls. Two of these furnaces were in operation when the mill started, two others had been lighted while the other four had been completed and would be lighted within a few days. In one of them a crushed coal firing device had been installed after extensive and successful experiments conducted in the old heating mill of the company. It is proposed to install them at each of the eight firing boxes, thus doing away with hand firing. The firing device was invented, patented and built by Chief Engineer Charles S. Heffelfinger of the Lebanon company. It is shown at Fig. 6.

Each furnace produces five heats an hour and is designed to manufacture balls weighing from 600 to 1200 pounds each, depending upon the size of material ultimately required. It is figured that each furnace will consume 54 magnesite bricks monthly. When the heat has run its length, the furnace having revolved slowly in the meantime to round the charge into ball shape, the operator who controls the number of revolutions absolutely by means of an electric controller, halts the operation while the door of the furnace stands at the bottom and by means of another controller operating the 15-horsepower motor attached to the exterior of the furnace, he opens the door and the ball falls through upon a chute. By gravity it passes onto a belt conveyor which is 130 feet long and travels toward the squeezer at the rate of 400 feet per minute. This ball conveyor is a double-strand 4-inch pitch steel strap bushed chain to which are attached at intervals of 16 inches steel flat crossbars, 3 x 1 inches, traveling on T-rail tracks. When the ball has arrived opposite



MILLS OF LEBANON VALLEY IRON & STEEL CO.

the squeezer, it is discharged upon a pivoted stand resembling in general appearance a hod, which by gravity in turn dumps the ball into its proper position in the 72-inch all cast steel squeezer. This squeezer was designed by the Lebanon company but built by the Hunsicker Engineering Co., Lebanon, Pa., especially of larger size than ordinary to take in balls weighing up to 1200 pounds. It makes six revolutions per minute, and is driven by a 24 x 27 reversing vertical side crank steam engine with 8-inch steam pipe, also built by the Hunsicker company.

When the squeezer has discharged the bloom, the latter falls upon another belt conveyor which moves toward the rolls on a 5 degree incline, it being designed to take a bloom 9 inches in diameter 3 feet 6 inches long. This conveyor travels at the rate of 150 feet per minute. It consists of a series of steel pans ¾-inch thick with flared sides 1½-inch deep. Each pan is 5¾ inches long and 8⅛ inches wide at the top. The conveyor is shielded by a stationary protector of steel plates which is shown in Fig. 3.

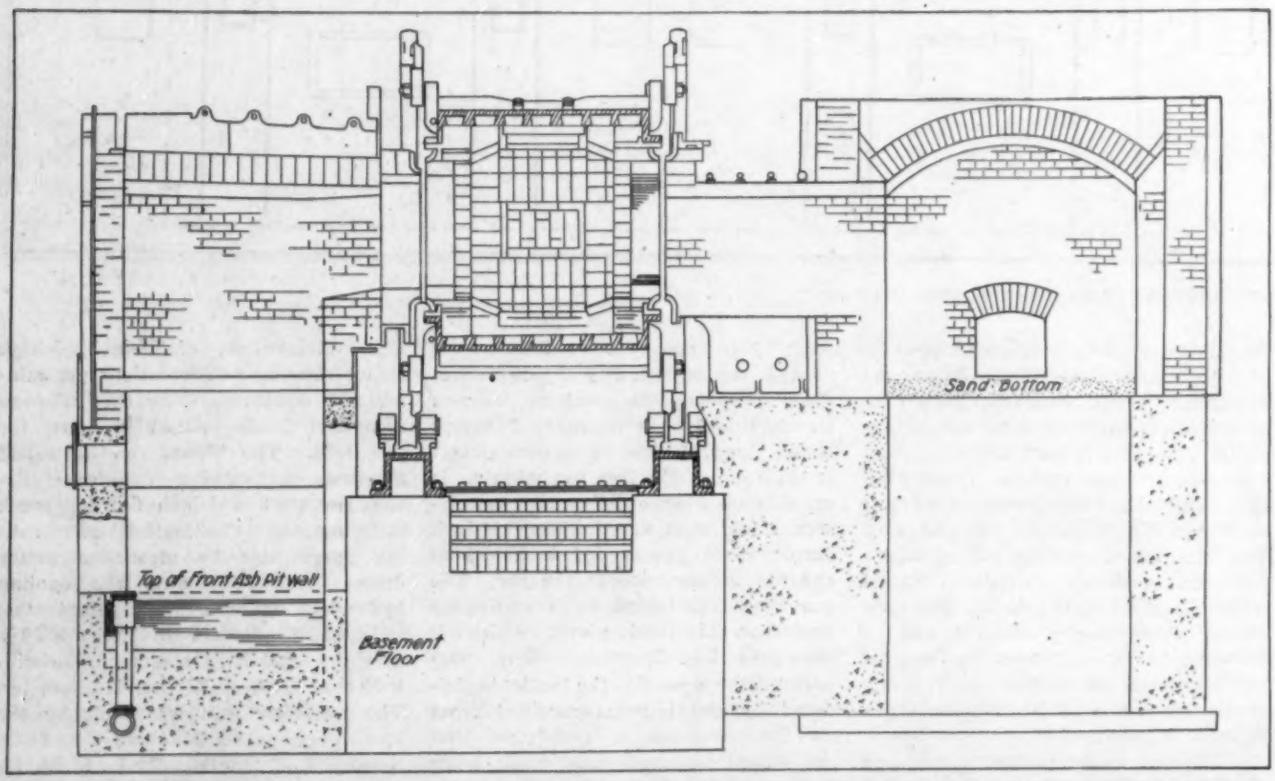
The first pass in the rolls is initiated by the impetus received from the bloom conveyor and after that the bloom is roughed by hand labor as in the usual muck mill. The roughing mill consists of 22-inch, 3-high stands running 48 revolutions per minute and were turned by the Lebanon company from special designs for this mill. The bloom can be rolled down to a 2 x 2-inch billet if desired or an 8 x 1-inch flat for muck bar purposes. The material after rolling passes out by means of motor driven floor rolls onto the cooling bed which is built of 85-pound steel rails. The rolls are driven by a 30 x 60 right hand Allis steam engine with a 30-ton flywheel 22 feet in diameter. The roughing mill was built by the Lewis Foundry & Machine Co., Pittsburgh. The cooling bed which is 80 feet long and 33 feet wide is

FIG. 3—ROLLING MILL SHOWING PROTECTION FOR BLOOM CONVEYOR

served on either side by a 5 x 5 billet or an 8 x 1 bar shear built by Hilles & Jones, Wilmington, Del., the material being conveyed on 12-horsepower, motor-driven, reversing rolls with push button control. Underneath the rolls is a 12-inch cast iron screw conveyor taking out the scale and built by the Lebanon company itself.

The furnaces, boilers and operating mills are all under one roof and are compactly put together, being built especially for the purpose. The main building consists of 19 bays each 20 feet long, or a total length of 380 feet. The width of this building is 147 feet 8 inches. On either side are railroad switch tracks under roof which serve the charging floors with coal and scrap. The coal is slack of usual grade. The scrap includes three grades, No. 1 wrought, turnings and light material. The scrap is lifted from the cars and deposited upon the charging floors on either side of the mill by 5-ton Electric Controller & Mfg. Co. cranes with 40-foot spans equipped with 45¼-inch magnets. The third 5-ton crane with 50-foot span serves the cooling bed. The entire center of the main mill building is served by a 20-ton electric crane with 50-foot span which is employed in changing rolls, assembling furnaces and all heavy-duty work.

The forced draft for the firing boxes



4—PLAN SHOWING FIRE BOX AT THE LEFT, ROTATING FURNACE IN THE CENTER AND WASTE HEAT CHAMBER AT THE EXTREME RIGHT

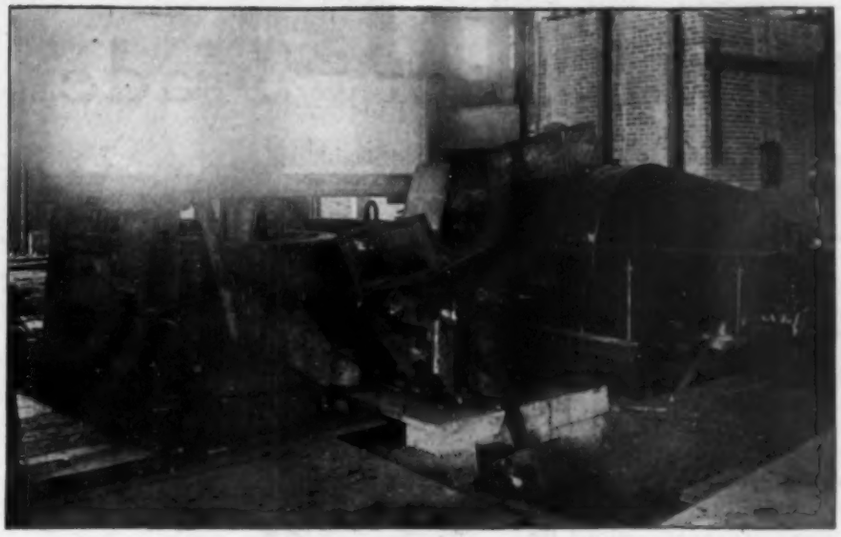


FIG. 5—THE GIGANTIC SQUEEZER AND BALL DUMPING DEVICE

is furnished by four No. 9 blowers built by the B. F. Sturtevant Co., Hyde Park, Mass., driven by 30-horsepower motors. They are mounted underneath the charging floors, which serve each side of the heating portion of the mill and are 100 feet long and 43 feet 6 inches wide.

The charging floors are so well arranged that two men serve with shovels one firing box each, operate the ingeniously constructed hand operated charging machine, etc., while the two electric controls on each of a pair of rotating heating furnaces are operated by one man, thus making each furnace served by 1½ man, a minimum of labor. Yet when the crushed coal system now being built is placed in operation at each furnace, even this minimum will be reduced probably to two men on a charging platform, one of these being a day laborer.

The main mill building is constructed upon massive concrete foundations as are also the foundations for the furnaces, roll stands and engines. The walls of the building are largely brick up to about 10 feet, and thence upward to the roof are of Fenestra steel sash and glass, thus affording splendid light in every portion of the building. The framework of the building is of structural steel, 500 tons being used by the Bethlehem Fabricators, Bethlehem, Pa., in its erection. The Belmont Iron Works put 70 tons of steel into the charging floor foundations. The building is roofed with interlocking cement tile made by the American Cement Tile Co., each tile being 52 x 26 inches and weighing 130 pounds.

The crushed coal firing device, which was invented, designed and patented by Chief Engineer Heffelfinger of the Lebanon company, consists of a hopper-feed with blower, coal crushed to 200-mesh screen being employed. The device first was tried out on the company's 10-inch reheating mill in the old plant, attaining such efficiency as to get heats ready in 15 minutes and putting the furnace in shape to charge in 40 minutes.

The Lebanon Valley Iron & Steel Co. began clearing the ground for the proposed mill on Oct. 26, 1918. The works, therefore, were less than nine months in being built and undoubtedly would have been in operation some weeks sooner except that the orders for material, equipment, etc., were placed under war conditions. When the Amalgamated Association of Iron Steel and Tin Workers went east of the Allegheny mountains something like two years ago and began to organize the puddlers, bar mill rollers, etc., in a number of plants, the Lebanon company prepared for what it believed would be an inevitable struggle to keep its mills in operation. A satisfactory site was selected just alongside the old puddle mill of the Lebanon company and active construction was begun last autumn. Therefore, when last April a strike was called in the hand mills of the company by the Amalgamated association, the company merely transferred its activities to the new mill and rushed work so that it now is virtually independent of any of its old plants and is not hampered by any union mill organization of its employes.

The president of the Lebanon Valley Iron & Steel Co. is Hon. W. C. Sproul, governor of Pennsylvania. The vice president, who has been actively identified with the new venture, is Felton Bent; while the secretary and treasurer is Howard Longstreth. The general manager, to whom is due much of the credit for conceiving and executing the splendid piece of work is Jno. C. Brown who has worked untiringly to bring the splendid success with which the project even this early has met. The chief engineer of the company, who designed much of the equipment as well as considerable of the plant layout is Charles S. Heffelfinger, who had served as crushed coal expert with the Philadelphia & Reading railroad. The master mechanic is Harry Moyer who has won well deserved encomiums for the masterly way in which the actual construction and installation were executed.

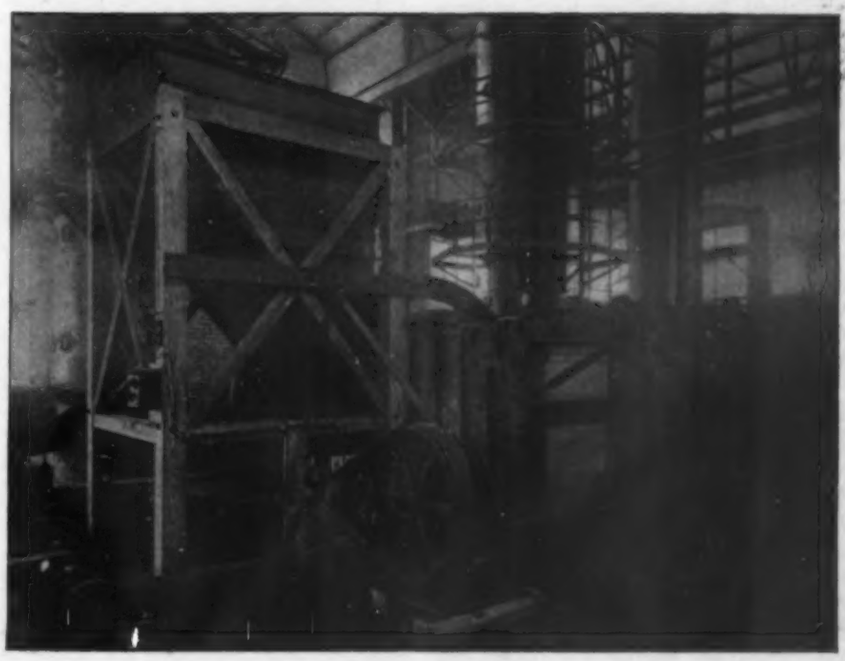


FIG. 6—AUTOMATIC CRUSHED COAL FIRING DEVICE

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

ALFRED LA MAR, assistant director of sales, has returned to Washington from Europe and resumed his duties in the office of the director of sales, war department. Mr. LaMar will have the immediate supervision of sales of surplus war materials made for export, and direct the activities of the machine tools section of the office of the director of sales. Mr. LaMar went to Europe early in April to survey European markets. He arranged the details of the visit recently made to the United States by a commission from the construction metallique which came to this country under the auspices of the Belgian government to inspect, with a view to purchasing, government-owned machine tools. Mr. LaMar organized the machine tool section of the office of the director of sales shortly after the establishment of that office by the secretary of war.

Marion F. Crawmer, former manager of the Chicago branch of the Detroit Twist Drill Co., has resigned to become associated with the Tool Salvage Co., Detroit.

Richard Goedecke, vice president of the Cleveland Duplex Machinery Co., Cleveland, has been appointed to have exclusive charge of the used machinery department of that company.

J. A. McGee of the sales department of the Graton & Knight Mfg. Co., Worcester, Mass., is on his way to Japan to investigate market conditions in that country.

E. T. Boland, for 15 years affiliated with the Kissel Motor Car Co., Hartford, Wis., has become associated with the Topp-Stewart Tractor Co., Clintonville, Wis., in the capacity of works manager.

Richard H. Long, head of the Richard H. Long Machinery Co., Framingham, Mass., has been nominated for governor of Massachusets by Democrats for the second successive year.

Gen. Guy E. Tripp, chairman of the board of directors of the Westinghouse Electric & Mfg. Co., sailed Sept. 20 for Europe for the purpose of completing arrangements for the extension of the foreign trade. General Tripp will be in Europe for the next six weeks.

T. E. Toomey has been made manager of the Boston Pulley & Shafting Co., 197 High street, Boston. For 15 years he was sales manager for the Dodge Sales & Engineering Co., that city.

William H. Chappell, for several years connected with the Page-Storms Drop Forge Co., Chicopee, Mass., has taken the superintendency of the drop forge department of the General Railway Signal Co., Rochester, N. Y.

Malachi G. Brennan, advertising manager for the Sanford Riley Stoker Co., Ltd., Worcester, Mass., has been transferred to the sales department of the Chicago office of the company. He will be succeeded by Otis C. Sheldon.

William E. Kelly has retired from active management of the Kelly Reamer Co.'s affairs at Cleveland. He was the company's president and general manager and his duties now are discharged by J. M. Davie, formerly assistant general manager.

E. V. Wenzill has been made manager of the grinding machine division in Chicago and vicinity for the Modern Tool Co., Erie, Pa. He formerly was affiliated with the Norton Grinding Co., Worcester, Mass., but for some time has been doing grinding work in France.

Otto Koch, Sheboygan, Wis., has resigned as assistant cashier of the Security National bank to become associated with the Wald Mfg. Co., Sheboygan, automobile parts and accessories, as a stockholder and sales manger.

H. J. Porter, who has been connected with the sales department of the Timken Roller Bearing Co., Canton, O., for the past eight years, has been advanced to the position of sales manager with headquarters at the general offices of the Timken company at Canton.

C. S. Crane has resigned from government service as supervisor of production and inspection in the motors and vehicles division of the quartermaster's corps and now is affiliated with the Wilton Tool & Mfg. Co., Boston, as mechanical and sales engineer.

Harry J. Lindsley and William F. Jennings have been promoted to be vice presidents of the Bound Brook Oil-less Bearing Co., Bound Brook, N. J. Mr. Lindsley has been western sales manager for seven years and Mr. Jennings has been eastern sales manager for about five years.

Lowell Pickup, who was a sergeant in the army and served overseas, has gone to Georgia to take charge of that territory for the Stanley Works, New Britain, Conn. Gerald Coholan, until recently a lieutenant in the army, has gone to California, in the interests of this same company.

Marshall C. Edmunds has been placed in charge as district sales manager of the sales offices established recently at 208 South La Salle street, Chicago, by the Sizer Forge Co., 244 Larkin street, Buffalo. His territory will comprise Wisconsin, Minnesota, Illinois, Iowa, Missouri and upper Michigan.

Herbert Duckworth has been promoted from assistant sales manager of the Norton Co., Worcester, Mass., to be chief sales manager. Capt. Robert E. Nugent, formerly in charge of the Groton Shipyard Housing Corp., has been placed in charge of the tile department to succeed F. A. Emery, who now becomes assistant to W. L. Neilson.

Wesley M. Beatty has been appointed to succeed Craig Geddis who recently resigned from the publicity department of the Mesta Machine Co., Pittsburgh. Mr. Geddis has filled that position since he was discharged from military service and now takes up new duties in the sales department of the Reading Iron Co., Reading, Pa.

J. R. Comber, who has been with the Timken Roller Bearing Co., Canton, O., for the past seven years, has been moved from the position at the head of the sales-order division to field work in connection with the tractor and farm implement division. George C. McMullen, Pacific coast representative of the Timken company, has opened an office at 450 Monadnock building, San Francisco.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

JESSE K. BARKER has been named as district sales manager in Seattle, Wash., for the Jones & Laughlin Steel Co., Pittsburgh. He recently was tendered a farewell dinner and presented a beautiful gold watch and chain by a number of his associates at the main office of the company. Mr. Barker, who has been identified with the Jones & Laughlin company for the past 29 years, is a native of Pittsburgh and has lived there all his life. His first connection with the company was in the freight traffic bureau and during the past 12 years he has been assistant to Robert Geddes, manager of the hot-rolled department of the company. The Seattle offices of the company are located in the L. C. Smith building.

R. S. Hunter has been made manager at Chicago of the Warren Oil Co. of Pennsylvania, Warren, Pa.

I. L. Houghton, vice president and general manager of the Maumee Malleable Iron Co., Toledo, O., has resigned. No announcement is made as to his further plans.

D. R. Scholes, resigned recently as second vice president of the Illinois Malleable Iron Co., Chicago, to become affiliated with the Aeromotor Co.

L. R. Custer, who was development engineer for the Midvale Steel & Ordnance Co., has been elected vice president of the Cambria Steel Co., Johnstown, Pa.

A. R. Gilham has been appointed managing director of Canadian Vickers, Ltd., Montreal. He formerly was associated with the St. John Dry Dock & Shipbuilding Co., Ltd., with headquarters at St. John, N. B.

W. J. Haddaway has been appointed sales agent for the Pioneer Coal & Coke Co., Syndicate Trust building, St. Louis. He will have charge of the distribution of Illinois coals, both steam and domestic.

Charles Riddell, formerly manager of the Chicago office of the Baldwin Locomotive Works and the Standard Steel Works Co., has returned to his duties in Chicago after an absence of 18 months on special duty at the Philadelphia office. Arthur S. Goble, who has been in charge of the Chicago office, has been made manager of the St. Louis office. Henry Blanchard, sales representative at Chicago for the Baldwin and Standard companies, has been made manager of a branch sales office in the Merchants National Bank building, St. Paul, Minn.

Samuel Siddall has retired from active participation in the business of the Warren Iron & Steel Co., Warren, O., having resigned as vice president and treasurer, a position held by him for about seven years.

JESSE K. BARKER

Paul D. Goodman resigned his connection with the Epping-Carpenter Pump Co., Pittsburgh, and on Oct. 1. became sales manager of Chas. F. Ames & Co., Ltd., 90 West street, New York City, which conducts the sales department of the Platt Iron Works, Dayton, O.

A. Brauer, Detroit, who has been associated with the Mansfield Steel Corp. for six months as body designer, has been promoted to the position of assistant general manager, in charge of production, quantity surveys and production engineering. Mr. Brauer formerly was in the government's service.

James N. Mackin, who represented E. C. Atkins & Co., Indianapolis, and Hamilton, Ont., manufacturers of silver steel saws, in Washington, during the war, has been appointed representative of the company in Australia with headquarters at 5 Australasia Chambers, Martin Place, Sydney, N. S. W.

Melville J. Collins succeeds William Lynch who resigned recently as general superitendent of the Mahoning Valley Steel Co., Niles, O. He has been identified with the Mahoning company since its formation and formerly was in the operating department of the Empire mills of the Brier Hill Steel Co.

R. S. Richards resigned as advertising manager and purchasing agent of the Atlas Car & Mfg. Co., Cleveland, on Oct. 1, to become president and general manager of the United Roll & Foundry Co., Ravenna, O., which has just been recapitalized and reorganized to manufacture rubber machinery and to conduct a jobbing foundry. Mr. Richards was connected with the Atlas company for 16 years.

C. A. Pennock has resigned as superintendent of the sheet and tin plate plant of the Bethlehem Steel Co., at Sparrows Point, Md., having filled that position since the plant was built. On Oct. 1, he accepted a position with the Eastern Rolling Mill Co., Baltimore, as general superintendent. Prior to going to Sparrows Point, Mr. Pennock was superintendent of the Massillon Rolling Mill Co., Massillon, O.

Lieut. Col. Julian S. Hatcher, of the ordnance department of the army, Washington, has been appointed commanding officer of the United States armory, Springfield, Mass., to succeed Col. Lindley D. Hubbell, who has been commandant since July, 1918. Col. Hatcher is 31 years old and the youngest man ever in charge of the Springfield plant. He has perfected numerous inventions in ordnance of all kinds and is an authority on machine guns.

Protest Ruling

Of Freight Rates on Returned Defective Castings and Forgings

Washington, Sept. 30.—An emphatic protest has been filed by foundrymen throughout the country with the railroad administration against a recent ruling of the official classification committee which in effect increases freight rates on returned defective castings and forgings. Malleable foundrymen especially have taken the lead in this movement. The order in question makes the freight rate on rejected material the same as that on perfect castings and forgings. Heretofore this material was classed as scrap and therefore shipped under the lower scrap freight rates.

The order follows:

"This committee has just given careful consideration to the question of rating properly applicable on return defective castings or forgings. A common practice among manufacturers, which seems to be spreading, is for the manufacturer of machinery or iron or steel articles, to contract with the foundry or steel mill for supply of rough castings or rough forgings, the contract providing that the castings or forgings in which imperfections are discovered during the machining process, shall be returned to the maker, who upon examination and finding of the defects will credit the purchases with the purchase price. It is generally impracticable for the manufacturer who has discovered defects in such articles, to break them in order to reduce them to a condition in which they would unquestionably be rated as scrap iron or steel, such breaking interfering with the examination to be made by the maker on return. Such articles, however, have in fact generally a value only as scrap iron or steel and are of no use whatever except for remelting. Owing to the peculiar conditions under which they are returned, however, they retain a value as castings or forgings until the maker has verified the defects found by the purchaser.

"This condition throws upon the carriers the responsibility which they would have in transportation of the original article and we, therefore, decline to view such articles as being entitled to the scrap iron or steel rating. On the other hand any work which the purchaser may have expended upon the article is absolutely lost. Owing to the defect discovered the work has added nothing watever to the value and we feel that it has not really advanced the article beyond the casting or forging state. We have therefore, ruled that such articles handled under the circumstances described, are ratable on their return journey as castings or forgings and have advised shippers to describe them on their bills of lading as defective castings or defective forgings. This ruling has been given directly with respect to castings returned by the Ellicot Machine Corp., Baltimore, to the York Foundry & Machine Co., York, Pa.; defective castings returned to manufacturers by the Hudson Motor Car Co., Detroit, and defective forgings returned by the New Process Gear Co., Syracuse, N. Y., to the Richmond Forgings Corp., Richmond, Va.

"We have also held that articles of iron or steel which have been originally shipped as finished articles, such as piston rods, and are found to be imperfect, are upon their return journey to the manufacturers, ratable the same as the new articles in a supposedly perfect condition."

Slick-Knox Co. Plant is Getting Under Way

The Slick-Knox Co., organized by Pittsburgh and Sharon, Pa., interests a few months ago, and which took over the buildings and equipment which formerly constituted the Wheatland, Pa., plant of the Blaw-Knox Co., as well as the Hydraulic Drawn Forging Co. and the Pressed Steel Truck Co., both of Ellwood City, Pa., will begin shipments of automobile and truck frames in about a week. While frames for automobiles and trucks will be the principal product of the company, it also will produce 3 to 6-inch balls, antirail creepers, under a patent of E. E. Slick, chairman of the company, and rings for gears and ball bearings. Later, the company will start the manufacture of tuyeres and bosh plates for blast furnaces at the Wheatland plant, while at its Ellwood City plant, it will make pressed steel industrial trucks of different types and designs and at some future date will also turn out other steel specialties at this plant.

The company acquired from the Blaw-Knox Co. at Wheatland a steel building, 115 x 500 feet, with all piping, wiring and equipment, together with a hotel, located on a site of 30 acres. Since this purchase, the company has bought 63½ acres of adjoining land and has taken an option of 27 more acres, which it probably will buy. Thus the company will have altogether more than 120 acres and is providing for future plant extensions. Foundations have been laid in the factory building for the installation of new machinery, which includes four 15-ton and two wall cranes of 3 tons each, furnished by the Morgan Engineering Co., Alliance, O., one 1800-ton press, one 1000-ton press, one 500-ton press, one 125-ton press and two 80-ton presses, all steam hydraulic.

The Mesta Machine Co., Pittsburgh, is building a 4000-ton steam hydraulic press, which will be completed and installed shortly. Installations since the property was turned over to the Slick-Knox Co. early this month include a 250-ton steam press, a 300-ton power press, a 125-ton power press, and a No. 5 upsetter, beside a number of smaller hydraulic and power presses. A number of steam hammers also have been installed and the company has expended in the open market more than $500,000 for other equipment. A new machine shop, 75 x 250 feet, and a new assembly shop, 150 x 300 feet, and under construction. These buildings will be fireproof throughout, being of brick construction with window frames and sashes of steel and having composition roofing.

The daily capacity of the Wheatland plant will be 900 automobile and truck frames, 10,000 gear and ball bearing rings, from 12,000 to 15,000 antirail creepers, about 2000 forged return ells and approximately 50 tons of 3 to 6-inch balls. The company expects to turn out about 200 industrial trucks per day at its Ellwood City plant.

General offices of the company, now located in the Farmers Bank building, Pittsburgh, will be removed, Oct. 1, to the Chamber of Commerce building. Officers of the company are: Chairman, E. E. Slick; president, L. L. Knox; treasurer and assistant secretary, A. M. Moreland; secretary retary, A. M. Moreland; secretary and assistant treasurer, A. R. McGill; vice president and sales manager, William McIntyre; vice president in charge of operations, C. K. Strausbaugh; auditor, C. L. Dumbauldt; general superintendent, F. J. Curtis; chief engineer and assistant manager, W. L. Schultz. L. C. Blackwell is general superintendent of the Ellwood City plant, while E. L. Peterson is sales manager of the truck department.

Adopts Thermit Welding

Recent approval of the thermit process of welding stern frames, rudder frames and other heavy sections of ships by the American bureau of shipping is expected to introduce the thermit method more generally in the shipyards. It is said that no marine welds made by this process have ever turned out as failures. Any number of these welds have been made in the past but they have been made without the official approval of the shipping bureau. The thermit process is a patent process controlled by the Metal & Thermit Corp., New York. Approval of the method is qualified in that the bureau must be notified sufficiently in advance to have a surveyor in attendance during the welding operation who will inspect and test the weld when completed.

September's Tool Trade Buoyant

Equipment Sellers Active Despite Labor Disturbances—Manufacturers Busy and Giving Deferred Deliveries—Allied Automotive Industries Continue to Lead in Buying—Several Fair Sized Lists Still Pending—Cranes Move Freely

BUOYANCY marked the past month's activity in the sale of machine tools and equipment. This was true despite the admitted fact that labor disturbances served as an effective brake upon buying and caused numerous purchasers to withhold action on issued lists. The buying movement continued right up to and even into the period following the calling of the general iron and steel strike and many dealers remain confident that before the strike has had time seriously to affect their business, it will be past history. It is believed that if labor could be appeased an era of great industrial activity would be ushered in and it is believed that tool selling then would resemble the busiest days of the wartime period. The labor troubles which really did affect the tool industry, were the strikes among machinists in Akron and elsewhere. Similar troubles are threatening in Cincinnati, Bridgeport, Conn., and other manufacturing centers. However, consideration of the delivery dates which are deferred anywhere from 8 to 12 weeks and in some cases 16, can only bring the conclusion that the machine tool industry is in a healthy condition both from a manufacturing and a selling standpoint. Prices which have been tending upward for some time now are within 10 or 12½ per cent of the highest levels which prevailed during the war and in several instances have reached the former basis.

Automotive Industries Buy Heavy Equipment

HEAVY equipment such as boring mills, planers, etc., has occupied a prominent place in the requests for prices as well as orders from the automotive industries. Orders for miscellaneous equipment were placed by the Cadillac Motor Car Co., Detroit, and the Studebaker Corp., South Bend, Ind. The Packard Motor Car Co., and the Hudson Motor Car Co., of the former city, indicated their intention to spend $1,750,000 and $2.250,000 respectively on buildings and equipment and placed some minor orders.

Manufacturers of automobile parts were factors in the month's buying. The Columbia Axle Co., and the Parish & Bingham Co., Cleveland, manufacturers of auto frames, bought miscellaneous equipment. The Electric Auto Lite Corp., Poughkeepsie, N. Y., inquired for several small machines and bought some for its Toledo, O., plant.

Tractor manufacturers again are active. The General Motors Corp. bought about $350,000 worth of equipment for its Janesville, Wis., plant. The Holt Mfg. Co., Peoria, Ill., closed on some of its requirements. The Cleveland Tractor Co., Cleveland, bought considerable land for early expansion. The Moline Plow Co., Moline, Ill., is understood to have supplied its requirements from government-owned stocks. Engineers of the Wellman-Seaver-Morgan Co., Cleveland, are consulting with dealers' representatives regarding equipment for a tractor plant at Akron.

Exporters Activity Somewhat Curtailed

FIGURES published during the month of September, indicated that exports of machinery in July were 48.4 per cent lower than in June. While some slight improvement is expected to show up for subsequent months, continuing low exchange rates have militated against the closing of a large number of export inquiries current in the eastern and other districts. Doubtless the largest single inquiry to appear, came from a Swedish automobile firm, which requires about 400 machines. China bought 12 drills through one New York exporter and Japan, which has been a large buyer in recent months, took many metal-working tools. Several trading companies in New York bought tools for export; these include the American Trading Co., and the Hagermeyer Trading Co. France, Belgium, England, Poland, Finland are some of the other countries to send inquiries for equipment to America.

Varied Manufacturers Indicate Tool Needs

SIZABLE lists of miscellaneous equipment were few and far between in the east during the month although fairly numerous in the Middle West. Two of the largest were issued by the Baldwin Locomotive Works, Philadelphia, and the Standard Oil Co., New York. The former closed on approximately $100,000 worth of equipment and the latter bought 50 machines for shipment to Roumania. R. Hoe & Co., Poughkeepsie, N. Y., bought a fair amount of miscellaneous equipment while the Duquesne Light Co. closed on a number of tools for its new plant at Cheswick, Pa. Armstrong, Blum & Co., Chicago, manufacturers of hacksaws, circulated a fair sized list as did the Economy Baler Co., Ann Arbor, Mich., and A. Bentley & Sons, Toledo; the latter asked for 28 machines. The Canadian Fairbanks Co., Ltd., Montreal, issued a list of 15 large machines for shipment to Vancouver. The American Borvist Co., silk manufacturer, and the Electric Vacuum Cleaner Co., Inc., both of Cleveland, closed on some machines, but the biggest lists current among Cleveland dealers came from rubber companies in Akron.

Many Crane Orders Placed in September

CRANE manufacturers have had all the business they could attend to properly during September. While steel plants took the lead in buying, locomotive manufacturers as well as the Standard Oil Co., made heavy awards; the latter bought 28 jib cranes for Bayway, N. J. The Baldwin Locomotive Works, Philadelphia, and the American Locomotive Co., New York, took 16 and 15 overhead cranes respectively, while the Phelps-Dodge Corp., New York, closed on 12 of the same type. The American Metal Co., New York and the Kelly-Springfield Tire Co., each bought three cranes and the American Shell Co., Paterson, N. J., and the United States Cast Iron Pipe & Foundry Co., Pittsburgh, each took one. Steel companies who closed on anywhere from one to five cranes of different types of cranes include the Carnegie Steel Co., for its Edgar Thomson works; the Donner Steel Co., Buffalo; the Bethlehem Steel Co., for Sparrows Point, Md.; the Witherow Steel Co., Corapolis, Pa.; the Worcester Pressed Steel Co., Worcester, Mass.; the Slick-Knox Steel Co., Wheatland, Pa.; the Pittsburgh Crucible Steel Co., Pittsburgh; the Interstate Iron & Steel Co., Chicago; Weirton Steel Co., Weirton, W. Va.; and the McKinney Steel Co., Cleveland. Inquiries still pending include one from the Carnegie Steel Co., for four cranes and one from the Cambria Steel Co., Johnstown, Pa., for five. The Midvale Steel & Ordnance Co., also is in the market for cranes for its different plants as is the Bethlehem Steel Co. Single crane purchases of overhead, locomotive and other types of cranes were numerous.

Machine Tool Buying Continues

Eastern Inquiries Outnumbered by Orders—Attractive Requests For Prices Current in West—Miscellaneous Inquiries Widely Scattered—Heavy Equipment Awards Postponed in Pittsburgh—Cleveland-Osborn and Stearns Companies Buy

LABOR dissension in iron and steel has not been reflected to any great extent in the machine tool industry up to the present time. The belief is freely expressed that the struggle will not be a long-drawn-out affair and its end may come quickly. In the East, orders are more numerous than inquiries and in Cleveland and vicinity, some extremely satisfactory business is being done, individual sales running all the way from $4000 to $20,000. The inquiry rate keeps up at a splendid rate in the West and in Chicago, machinery merchants claim to be entirely unaffected by the strike. Pittsburgh, where many steel plants have been negotiating for equipment, is hardest hit and many prospective purchasers have postponed action on their requirements of cranes and other heavy equipment. It is believed, however, that were the labor question settled a huge amount of business would come out, since a vast number of projects either are at or are nearing the breaking point. What little unrest in the machinery industry that does exist at present is found among machinists in the tool manufacturing centers such as Brooklyn, N. Y., Paterson, N. J., Bridgeport, Conn., and Cincinnati, O.

Two companies to fill their machine tool and equipment requirements from government-owned stocks recently are the Moline Plow Co., Moline, Ill., and the Remington Typewriter Co., Ilion, N. Y. The latter bought about 50 new or slightly used machines. Others have made efforts to buy but ensuing delays have discouraged them.

A strong tendency is noted in the West for companies who formerly sent machine repair work out, to establish their own machine shops and this has contributed greatly to the current demand.

The largest inquiry current in Cleveland, comes from A. Bentley & Sons, Toledo, O., and the specifications cover many tools. The F. B. Stearns Co., and the Cleveland-Osborn Mfg. Co., Inc., both of Cleveland, made sizable purchases recently. Others in the market include the Uncle Sam Tire Co., Cleveland, and the Corrugated Roofing Co., Minneapolis. The General Motors Corp., Detroit, is reported to be continuing its expansion program and recently purchased three plants in Dayton, O.; the Dayton-Wright Airplane Co., the Dayton Metal Products Co., and the Domestic Engineering Co.

Several new inquiries are out for cranes in the East including one from the American Car & Foundry Co., New York City; one from Claiborne, Johnston & Co., Baltimore, and one from the Midvale-Cambria Co., Boston. The Trans-Continental Merchants, Inc., New York City, wants 59 chain hoists from ½ to 20-ton capacity, for shipment to Japan. Single recent crane purchasers include the Framingham Foundries, Inc., Framingham, Mass.; the Gregg Co., Ltd., Hackensack, N. J.; the Nazareth Foundry & Machine Co., Nazareth, Pa.; and the Carbondale Machine Co., Carbondale, Pa. Dwight P. Robinson & Co., New York City, and J. Lipsitz, Lebanon, Pa., purchased locomotive cranes. Deliveries on this type are improving, one week to 10 days now being all the limit required.

Machine Tool Orders Exceed Inquiries in East

WHILE no large orders are being placed, the total volume of business being awarded in the eastern machine tool market is said to be fairly good. Some sellers report a rather odd situation. They state that despite the unsettlement caused by the steel strike, more orders are being received than inquiries. This development, they assert, is difficult to account for, but nevertheless, they take it as indicating considerable confidence in the trend of events.

At present, the labor situation in the machine tool industry is being little affected by the trouble in the iron and steel industry. A large strike has been threatened by machinists in Brooklyn and trouble may also develop in the Cincinnati district; however, with the improvement in the steel situation, many are hopeful that all trouble may be averted. There has been considerable unrest in Paterson, N. J., and in Bridgeport, Conn., with plants either closed down or partly so, but as a general proposition, the builders of machine tools have not been seriously affected of late by dissension in their own ranks.

The offering of new and used machines by the government and various companies formerly engaged heavily in war work, is being felt, although not to the extent that was expected earlier in the year. This is accounted for in measure by the delay that accompanies practically all transactions where government equipment is involved. However, a recent sizable order to be placed with the government in the East is that of the Remington Typewriter Co., Illion, N. Y., involving about 50 machine tools, either new or slightly used. Sellers, however, are taking an optimistic viewpoint of the situation, stating that the sooner this equipment is sold, the more healthy the market will become.

During the past few days an advance of 15 per cent has been noted in a leading line of shapers. Other

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The larger illustration shows a ¾" octagon chisel driven through a block of 0.35 per cent carbon steel 2½" thick. Both punch and chisel are file hard.

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Chisels made of Seminole Steel will cut armor plate, nickel rivets and alloy steel billets—and yet, if hammered carefully, they may be bent over the edge of an anvil. They are foolproof in heat treatment, and will not fail in use.

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advances have been noted, but they have been confined almost entirely to special tools.

One of the largest building projects to come up in the East of late is a $1,000,000 plant addition for the International Motors Co., at Allentown, Pa. Another sizable project is a 1-story machine shop, 80 x 220 feet, for the Carbondale Machine Co., Carbondale, Pa. The company now is buying equipment, having already purchased a 5-ton gantry crane.

While there have been no large lists during the past few days, the eastern crane market continues fairly active. Several new inquiries calling for one and two cranes, are out, and orders are being placed steadily. Included in new business is a 10-ton overhead crane for the American Car & Foundry Co., 165 Broadway, New York City. Claiborne, Johnston & Co., Baltimore, are in the market for two 5-ton cranes, with 50 and 75-foot spans respectively. The Midvale-Cambria Co., Boston, is inquiring for a 10-ton crane, with a 65-foot span. The American Metal Co., New York City, has withdrawn its inquiry for one 5-ton and two 10-ton electric cranes, and now is asking for bids on a 25-ton handpower crane. This crane is for Monterey, Mexico.

A feature of the demand is an inquiry for 59 chain hoists, ranging in capacity from ½ to 20 tons. This inquiry has been issued by Trans-Continental Merchants, Inc., 80 Maiden Lane, New York City. The equipment is for Japan, and is as follows: Five ½-ton, 10 1-ton, five 1½-ton, five 2-ton, 10 3-ton, three 4-ton, 10 5-ton, two 8-ton, five 10-ton, one 20-ton and three 15-ton hoists.

Orders of the past week include a 10-ton electric, placed with the Chesapeake Iron Works by the Framingham Foundries, Inc., Framingham, Mass. The Gregg Co., Ltd., Hackensack, N. J., awarded two 7½-ton cranes with spans approximating 58 feet, to the Champion Engineering Co. The Nazareth Foundry Co. & Machine Co., Nazareth, Pa., has placed a 15-ton overhead crane with the Shaw Electric Crane Co. The 28 jib cranes for the Bayway, N. J., plant of the Standard Oil Co. of New Jersey, referred to last week as having been placed, went to the New Jersey Foundry & Machine Co. The Carbondale Machine Co., Carbondale, Pa., has placed a 5-ton gantry crane, with 76-foot span, with the Shepard Electric Crane & Hoist Co.

Deliveries on locomotive cranes are improving steadily. Whereas a few weeks ago several of the builders were booked up a month or six weeks in advance, shipments can now be made most generally within a week or 10 days. Included in awards of the past week is a 20-ton crane for Dwight P. Robinson & Co., 6 Broadway, New York. This business went to the McMyler-Interstate Co., Bedford, O. In addition to the 15-ton crane noted last week, for Chelsea, Mass., J. Lipsitz has also placed a similar sized crane with the Orton & Steinbrenner Co., for Lebanon, Pa.

Strike Brings Postponements in Pittsburgh

WITH no small proportion of the recent inquiries for cranes and other heavy equipment coming from steel manufacturers or industries in close relation with the steel business, the intervention of the strike and the consequent closing down of a number of plants, has brought an indefinite postponement of the placing of orders. Agents of manufacturers of heavy machinery generally in the Pittsburgh district report business to have been quieter in the past week than for several months. Demand for machine tools also has suffered [illegible]tion and the tendency is to ascribe the decline to the unsettled labor situation. Few, if any, of the machinery or tool manufacturers are affected by the strike.

Much Tool Business Current in Cleveland

NOTICEABLE effects of the general iron and steel strike upon the manufacture and sale of machine tools in the Cleveland district are as yet lacking. Sellers report the receipt of numerous inquiries contributed by a widely scattered trade. Orders too are frequent, although sizable business is not being placed at present. However, several orders aggregating from $4000 to $20,000 were placed among Cleveland dealers during the past week. The trade is sanguine as to the early settlement of the difficulty but at the same time realizes that should the strike last another week, the automotive industry will be hard hit, since stocks of raw materials are not carried for long periods. If the automobile manufacturers and allied interests are obliged to shut down, then the machine tool market will experience a set back, because most of the present business is coming from those industries.

The largest inquiry current among Cleveland distributors is the one from A. Bentley & Sons, Toledo, O., mentioned last week. The value of this business is estimated to be in excess of $1,500,000; the company has issued blueprint specifications which cover all types of machine tools as well as other equipment, and so far

Plow Company Obtains Federally-Owned Tools Quickly

WASHINGTON, Sept. 29.—Approximately 80 per per cent of the machinery required by the Moline Plow Co., Moline, Ill., to re-equip its tractor plant which was damaged by fire on Aug. 26, has been purchased from the ordnance department and air service, war department, in co-operation with the machine tool section of the office of the director of sales. This equipment has since been delivered. Brief reference was made to this in recent issues of THE IRON TRADE REVIEW.

On the day of the fire, Vice President R. W. Lea, of the Moline company, under the direction of its president, George N. Peek, formerly vice chairman of the war industries board at Washington, telegraphed to the director of purchase, storage and traffic of the war department, advising him that the complete machine equipment of the company's Universal tractor plant, consisting of engine lathes, turret lathes, automatic screw machines, milling machines, gear hobbers, grinding machines, upright boring mills, single and multiple spindle drills and radials, had been burned and that the company was in the market at once for this equipment, and asking if the war department could supply it with the necessary replacement machinery from the government surplus stocks without delay.

On Aug. 27 a representative of the director of sales left Washington for Moline and on Sept. 9, the war department had sold and put in transit the milling machines, planers and grinders required from the Chicago and Cincinnati districts of the ordnance department and the Chicago district of the air service. Prices were arrived at by the price-fixing chart adopted some time ago by the war department.

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The life of the chain is prolonged because the wheels do not rapidly wear away from the proper pitch diameter.

>FLINT-RIM< wheels have by years of service under the most trying conditions, fully demonstrated that they are the best wheels ever offered for durability and satisfactory operation.

This is particularly noticeable where the material handled is of a rough abrasive nature, such as Cement Clinker, Crushed Stone, Phosphate, Ashes, etc.

The reason for this great success is that the >FLINT-RIM< wheels have smooth, hard bearing surfaces for contact with the links, and are carefully fitted for the chains, thus giving an ideal condition to start with, and maintaining it so persistently that both the wheels and chain are practically insured against undue wear.

The material increase in the efficient life of the installation, eliminates the expense of frequent renewals, and greatly reduces the ultimate cost.

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Cleveland	429 Rockefeller Bldg.
Detroit	832 Dime Bank Bldg.
Kansas City, Mo.	306 Elmhurst Bldg.
Seattle	576 First Avenue, S.
Portland, Ore.	First [illegible] Bldg.
San Francisco	582 Market St.
Los Angeles	242 N. Los Angeles St.
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as can be learned little or none of it has been awarded. A smaller inquiry is issued by the Uncle Sam Tire Co., 1908 Euclid avenue, Cleveland; it calls for one each 60-inch boring mill, 20-foot lathe and hack saw with 6-inch capacity. The Bonnot Co., Canton, O., wants a large boring mill and a 6-foot radial drill. The Auer Register Co., Cleveland, wants a squaring shear and the Cuyahoga Tool Co., that city, is in the market for some equipment, including milling machines. The Corrugated Culvert Co., Minneapolis, is in the market for a riveting hammer, an air compressor, a forging furnace, an automatic screw machine and a threading machine. The Kull Machine Co., 2350 East Fifty-fifth street, Cleveland, is advertising for a 5/8 or 3/4-inch Cleveland automatic model B screw machine and a punch press. The Enterprise Aluminum Co., Massillon, O., desires to obtain a 24-inch lathe while the National Safe & Lock Co., Cleveland, is in the market for a cold saw. Among the machine tools wanted by the Molle Typewriter Co., Oshkosh, Wis., is some automatic screw machines, and Frank D. Fuller, president of Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of truck transmissions, advises his company soon will be in the market for machinery for a 40,000 square foot addition to his plant.

Two of the larger purchasers in Cleveland recently are the F. B. Stearns Co. and the Cleveland Osborn Mfg. Co., Inc., both of Cleveland. The former purchased four No. 2A Warner & Swasey turret lathes, complete with bar and chucking equipment. The Cleveland-Osborn company bought three No. 35 Landis horizontal, boring, milling and drilling machines. The Lewis Steel Products Co., Toledo, O., is understood to have placed its order for 10 or 12 grinders and wants two by express. The best delivery offered by the Brown & Sharpe Mfg. Co. on the type of equipment wanted is April 25 and on some of the machines it produces, delivery cannot be made before October, 1920. Other delivery dates run into May, June, July, etc., of next year, very few of its machines being available for 1919 delivery. Work has started on its 80 x 300-foot machine shop. The Western Gears & Parts Co., Dallas, Tex., is understood to have closed upon most of its requirements.

Manufacturers who are expected to enter the market for equipment soon for additions, new buildings, etc., represent different lines of activity. The C. & G. Cooper Co., Mt. Vernon, O., maker of engines, etc., is to spend $500,000 on new buildings, including an extension to its machine shop. The Hoover-Suction Sweeper Co., North Canton, O., is to erect a 4-story addition, 80 x 170 feet. The National Spring Products Co., Gary, Ind., is reported to be ready to erect a 4-story plant, 500 x 890 feet. The Fulton Foundry & Machine Co., Cleveland, has awarded a 100 x 111-foot addition. The Thompson Grinder Co., Springfield, O., will erect a 1-story factory, 62 x 200 feet. Other companies in the automotive trades who are arranging for expansions include the Automobile Equipment Co., Blackstone building, Cleveland; the Champion Ignition Co., Flint, Mich; the Hupp Motor Car Co.; the Maxwell Motor Co., and the Page-Detroit Motor Car Co., Detroit; the Apex Motor Co., the Michigan Machine Co., and the J. W. Murray Mfg. Co., that city. Action of some sort in Cleveland is expected to be taken by the National Supply Co., Toledo, O.

Chicago Market Unaffected by Strike

BUYING of machine tool equipment in the Chicago market has not been affected by the strike in the steel industry, as far as merchants are able to determine. The large volume of inquiry and sales in single tools or small lots continue, although buying in larger lots still is absent.

One factor which brings considerable business as noted by several sellers, is the establishment of small machine shop plants to do repair work which formerly was sent out to general shops. Apparently this practice has proven unsatisfactory and many companies are preparing to do their own repair work. As an instance of the unusual sources from which this demand comes, a Chicago seller recently took an order for several light tools from a concern which operates a mill to grind cattle feed, the equipment being designed to make repairs on the mills and conveying machinery.

Strong demand for additional equipment is being received from manufacturers of road building machinery, gasoline engines, truck and automobile engines, concrete mixers and heavy duty tractors. The only recent change in prices is an advance of 10 per cent on radial drills which is general. Deliveries are becoming more advanced, and 60 to 90 days or more is now the rule.

The St. Louis Brass Mfg. Co., St. Louis, will build a 6-story factory building. The Michigan Machine Co., Detroit, will build a 3-story factory building. The Maytag Co., Newton, Iowa, is building a foundry. Ponca City, Okla., has voted $200,000 for a waterworks system and electric light plant.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

PORTLAND, ME.—The American Zinc Co. of Ohio has been incorporated with $1,000,000 capital by C. A. Hight and H. P. Sweetser.

WESTMINSTER, VT.—A $200,000 shop, one story, 150 x 500 feet, will be erected by the Abenaquet Machine Works.

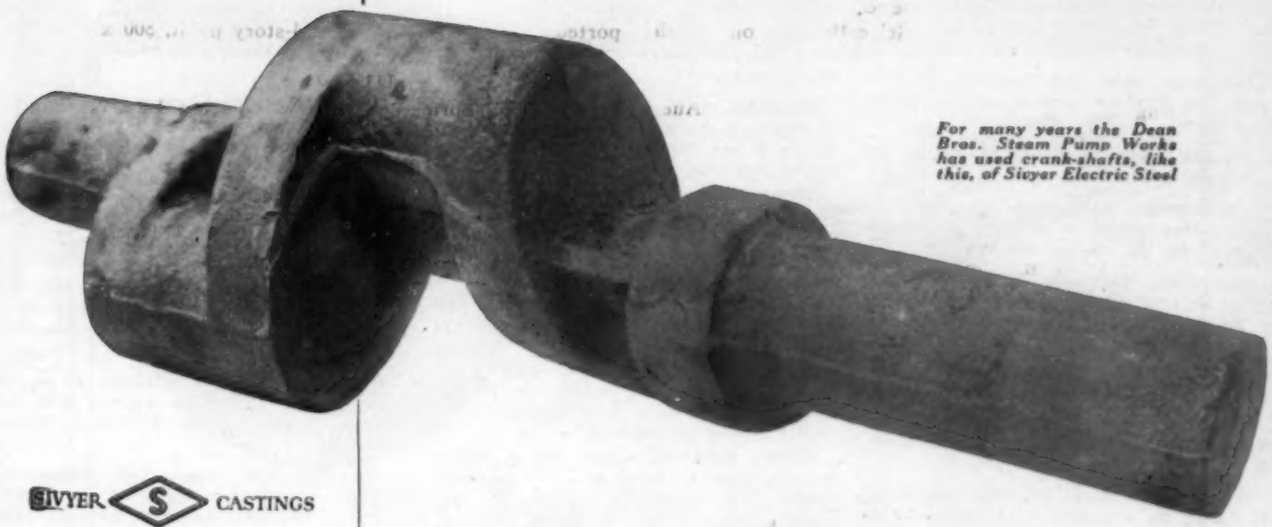
BEVERLY, MASS.—The United Shoe Machinery Co. has let a contract for a storage building to cost $500,000.

BOSTON.—The Landis Machine Co. is having plans drawn for a machine shop, 1-story, 20 x 120 feet, to cost $65,000.

BOSTON.—The United States Steel Toy Co. has been incorporated with $75,000 capital by K. A. Juthe, John C. Juthe, Allston, Mass., and John R. Riggleman.

BOSTON.—The Barnstead Mfg. Co. has been incorporated to make sterilizers, stills, etc., with $40,000 capital by Hiram Barron, J. Hiram Smith and A. P. French.

BOSTON.—The Lithuanian Mechanics & Machinists



For many years the Dean Bros. Steam Pump Works has used crank-shafts, like this, of Sivyer Electric Steel

SIVYER (S) CASTINGS

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

THIS crank-shaft casting is one of many interesting illustrations of the merits of Sivyer methods and metal that have won for Sivyer Castings their national market. Crank-shaft castings must be absolutely sound, entirely free from shrink-holes and other defects. Cast crank-shafts must be made of superior steel so thoroughly annealed that they will have to the utmost that superior strength and resistance to crystallization so vitally essential to their function. For years Sivyer methods and metal have produced for Dean Bros. cast crank-shafts so free from flaws, so thoroughly proof against crystallization, that the record thus made has influenced a number of manufacturers in different sections of the country to come to Sivyer for similar castings.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Say you saw it in THE IRON TRADE REVIEW

Corp. has been incorporated to manufacture machinery, autos and accessories with $100,000 capital by Jonas L. Girdvianis, Peter Dangveckis, South Boston, Mass., and A. Valantiejus.

CAMBRIDGE, MASS.—Bids closed Sept. 27 for a 2-story, 85 x 80-foot warehouse for the Riverside Boiler Works.

CHELSEA, MASS.—The Richard T. Green Co. will take figures for a dry dock.

EASTHAMPTON, MASS.—Plans have been drawn for a 2-story addition to the plant of the West Boylston Mfg. Co., to cost $325,000.

FAIRHAVEN, MASS.—The Atlas Storage Warehouse, Inc., will build a 1-story refrigerating plant, a 3-story, 75 x 200-foot warehouse and a 1-story, 30 x 40-foot boiler house.

HOLYOKE, MASS.—The Wells Hardware Co., Inc., plans a 4-story building, to cost $50,000.

WEST SPRINGFIELD, MASS.—The Gilbert & Barker Mfg. Co. will begin work shortly on a 1-story, 30 x 140-foot building.

WHITINSVILLE, MASS.—The Whitin Machine Co. is planning the construction of 31 cottages for its employes.

WINTHROP, MASS.—The Universal Metal Products Co. has been incorporated with $25,000 capital, by Daniel B. Riley, Wilfred E. Tait and William Milnes.

WOLLASTON, MASS.—The Tubular Rivet & Stud Co. is taking bids for a building.

WORCESTER, MASS.—The Norton Co. has let the contract for a 1-story, 40 x 400-foot kiln building.

WORCESTER, MASS.—The Worcester Auto Lock Co. has been incorporated with $20,000 capital by William C. Bemis, Patrick F. O'Hara and Isidor Freed.

WORCESTER, MASS.—The Standard Specialty Co. has been incorporated to manufacture machines and machinery with $10,000 capital by Claire W. Deardorff, Wallace A. Hutchinson and R. H. Montague, Millbury, Mass.

WORCESTER, MASS.—Contracts have been awarded by the Coppus Engineering & Equipment Co. for an $80,000 foundry.

WORCESTER, MASS.—The Worcester Brass & Electro Plating Co. has purchased the factory of Oliver M. Dean & Sons, 316 Shrewsbury street, for $27,000 and will move there.

CENTRAL FALLS, R. I.—The Rhode Island division of the National Lamp works of the General Electric Co. has let the contract for a 3-story, 50 x 96-foot warehouse to cost $50,000.

WOONSOCKET, R. I.—The Electric Maintenance & Engineering Works, 143 Railroad street, has been organized to manufacture electrical specialties, by Arthur Dauray, 186 Harrison street, and others.

WOONSOCKET, R. I.—The Rhode Island Machine & Tool Co. has been incorporated with $100,000 capital by Wilfrid Jacques, H. Eugene Getchell, Raymond P. Jacques and Arthur A. Jacques.

BRISTOL, CONN.—The Sessions Clock Co. has let the contract for a 1-story, 40 x 110-foot factory addition.

BRISTOL, CONN.—The J. H. Sessions & Son Co., hardware, has let a contract for an addition, four stories, 72 feet long.

HARTFORD, CONN.—The Electric Parts & Service Co., 1271 Main street, has been incorporated to manufacture electrical equipment, by C. H. Schrag, Ashford street; and others.

NEW HAVEN, CONN.—A $25,000 machine shop, two stories, 44 x 100 feet, will be erected by the New Haven Machine Co.

NEW HAVEN, CONN.—The Texas Oil Co., 17 Battery place, New York, will build a garage and machine shop and office building here at the cost of $35,000.

WEST HARTFORD, CONN.—The Whitlock Coil Pipe Co. is about to start work on a plant addition, 1-story, 45 x 114 feet, to cost $15,000.

North Atlantic States

ALBANY, N. Y.—Hunt, Helm & Ferris is having plans drawn for a factory and storage building.

ALBANY, N. Y.—The Kelly-Dennin Co. has plans for a 1-story machine shop, 150 x 150 feet, to cost $50,000.

ALBANY, N. Y.—The Thatcher Foundry & Propeller Corp., has plans for a cupola house and machine shop.

ALBANY, N. Y.—G. Wander & Sons, 135 Church street, will erect a plant addition, 3-stories, 70 x 128 feet, at a cost of $50,000.

BROOKLYN, N. Y.—The Jensen Oil Engine & Machine Co. recently was incorporated with $20,000 capital, by C. P. and B. Jensen, 220 Wakeman place.

BROOKLYN, N. Y.—The A. Schader's Sons, Inc., 783 Atlantic avenue, brass and metal products, is building a plant, 90 x 196 feet, at an estimated cost of $450,000.

BUFFALO.—The Harrison Radiator Corp. has awarded a contract for a plant addition, 1-story, 160 x 289 feet.

ELMIRA, N. Y.—The Chemung Foundry & Supply Co. has been incorporated with $50,000 capital, by H. N. Rubin, J. P. and J. D. Ward.

ESOPUS, N. Y.—The Franco-Engine & Fuel Corp. recently was incorporated with $20,000 capital, by F. Bien and J. L. Frieder, 353 West 118th street.

LARCHMONT, N. Y.—The Standard Steel & Bearings, Inc., recently was incorporated with $20,000,000 capital, by Harold C. Pryer, Ralph A. Gamble, Larchmont, N. Y., and Edwin D. Robbins, New Haven, Conn.

LOCKPORT, N. Y.—The Lockport Auto Radiator Corp. has been incorporated with $30,000 capital, by J. L. Branch, C. D. Nye and F. M. Capell.

LOG ISLAND CITY, N. Y.—A $300,000 factory building will be erected by the Gehnrich Indirect Heat Oven Co., 60 Franklin avenue, Brooklyn.

LONG ISLAND CITY, N. Y.—The Nichols Copper Co. has plans for a 1-story addition, 157 x 182 feet, to cost $75,000.

NEW BALTIMORE, N. Y.—The New Baltimore Shipbuilding & Repair Co. has been incorporated with $45,000 capital, by W. J. Wade and others.

NEW YORK.—The Aluminum Co. of America, 120 Broadway, has awarded contracts for a plant addition, 3-stories, 125 x 300 feet.

NEW YORK.—Lockwood, Greene & Co., engineers, has prepared plans for a power plant extension for the C. H. Nasland & Sons Co.

NEW YORK.—The Empire Polishing, Metal Plating Co. has been incorporated with $10,000 capital, by E. C. Kelly, 55 Liberty street.

NEW YORK.—The Dry Dock Sheet Metal Works, 140 West Forty-second street, has acquired a site on which it will erect a plant.

NEW YORK.—The Donoghue Machine Co. has been chartered with $50,000 capital, by J. and J. C. Donoghue and H. Koch, 1790 Walton avenue.

NEW YORK.—The Utility Heater Co. recently was chartered with $10,000 capital, by A. A. Berman, A. Sykes and L. Siegel, 10 East Fifteenth street.

NEW YORK.—The Philip P. Smith Co., metal products, recently was incorporated with $10,000 capital, by P. G. and S. L. Simon and P. P. Smith, 11 Broadway.

NEW YORK.—The Empire Repair & Electric Welding Co. has been incorporated with $1,000,000 capital, by R. C. Thackhara, E. F. Luckenback and C. Kuhne, 41 Whitehall street.

NEW YORK.—The Ess De Ess Machine Corp. recently was incorporated with $5000 capital, by T. Smirnoff, H. Dashmna and J. Stirias, 11 West 126th street.

NEW YORK.—The Acme Furnace Equipment Co., capitalized at $21,000, recently was incorporated by R. W. Owncs, E. W. Stuart and F. M. Clute, 100 Broadway.

NEW YORK.—The McPhilben Lighting Fixture Co. recently was incorporated with $43,000 capital, by M. Malk, H. Schneider and B. Schaefer, Queens, N. Y.

NEW YORK.—The Garment Trade Machinery & Equipment Corp. has been incorporated with $30,000 capital, by M. Schwartz, L. and M. Rosenbaum, 1084 Forest avenue.

NEW YORK.—The Midland Accessories & Supply Co. has been incorporated with $25,000 capital, by J. J. Rafferty, E. W. Fox and W. G. Gooldy, 536 West 145th street.

NEW YORK.—The Russian Electric & Engineering Corp. of America has been incorporated with $5000 active capital, by W. Paul, C. Eakin and J. J. Hayden, 258 Broadway.

NEW YORK.—The Furnace Engineering Co. recently was incorporated with $10,000 capital, by H. S. Steicher, E. B. Priebe and W. C. Drake, Inwood, N. Y.

NEW YORK.—The Klingtite Mfg. Co., machinery and chemical apparatus, chartered with $125,000 capital, recently was incorporated by O. Turner, R. S. Allen and W. G. Conpaughton, 672 St. Nicholas avenue.

NEW YORK.—Horace G. Cooke, Inc., blowers, exhausters, pumps, etc., recently was incorporated with $100,000 capital, by B. N. Bishop, G. P. Breckenridge and H. G. Cooke, 300 West 109th street.

NEW YORK.—The Stephen Decatur Hausler Co., hardware, tools and metal specialties, has been incorporated with $20,000 capital, by J. Lebowich, I. Bernstein and S. D. Hausler, 233 West 107th street.

NIAGARA FALLS, N. Y.—The Niagara Machine & Tool Co. has awarded a contract for a plant addition.

NIAGARA FALLS, N. Y.—The Carborundum Co. will build an addition to its plant on Buffalo avenue to cost $92,000. George B. Rayner is general manager.

RENSELAER, N. Y.—L. J. Tibbitts, 312 Broadway, contemplates a machine shop and garage estimated to cost $30,000.

ROCHESTER, N. Y.—The Co-Operative Foundry Co. has had plans drawn for a plant addition.

ROCHESTER, N. Y.—The Northwestern Aeroplane Co. has been incorporated with $50,000 capital, by C. and W. F. Smith and F. A. B. Jonklund.

ROCHESTER, N. Y.—The Davenport Machine Tool Co. recently was incorporated with $325,000 capital, by W. S. Davenport, C. R. Burt and C. W. McKay.

SYRACUSE, N. Y.—The Spring Nut Lock Co. has been incorporated with $25,000 capital, by L. O. Keith, W. R. Hollywood and A. E. Culver.

SYRACUSE, N. Y.—The Inland Marine Corp. has been incorporated with $100,000 capital, by D. E. Alvord, B. E. Shore and M. S. Melvin to manufacture marine equipment.

ALLENTOWN, PA.—A $1,000,000 plant addition, two stories, 300 x 600 feet, will be erected by the International Motors Co.

CARBONDALE, PA.—The Carbondale Machine Shop

Kreodone
EVERLASTING
WOOD BLOCK FLOORS

Know Why You Are Buying What You Are Buying

THE engineers of the Big Four Railroad studied every available flooring material when selecting the floor to go in the Wheel Shop at Indianapolis. And they finally chose Kreodone Wood Blocks as being best suited to meet the tremendously hard service to which their floor must be subjected.

When you place *your* contract for floor blocks, be certain to specify treatment with *pure, unadulterated creosote oil—free from even a trace of tar.*

Kreodone is not only a pure unadulterated creosote oil. It is a refined, condensed, creosote oil, permanent and non-volatile.

BEAR in mind that the kind of oil used in treating the blocks is the most important factor in successful service—to insure permanency.

A KREODONE floor, laid according to our specifications, will give longer and better service than any other known type of industrial floor and never requires repair or replacement.

Time has proved the fact. Let us give you the proof—our references.

Write for our illustrated, free booklet giving our reasons WHY you should use KREODONE—*the pure creosote oil block.*

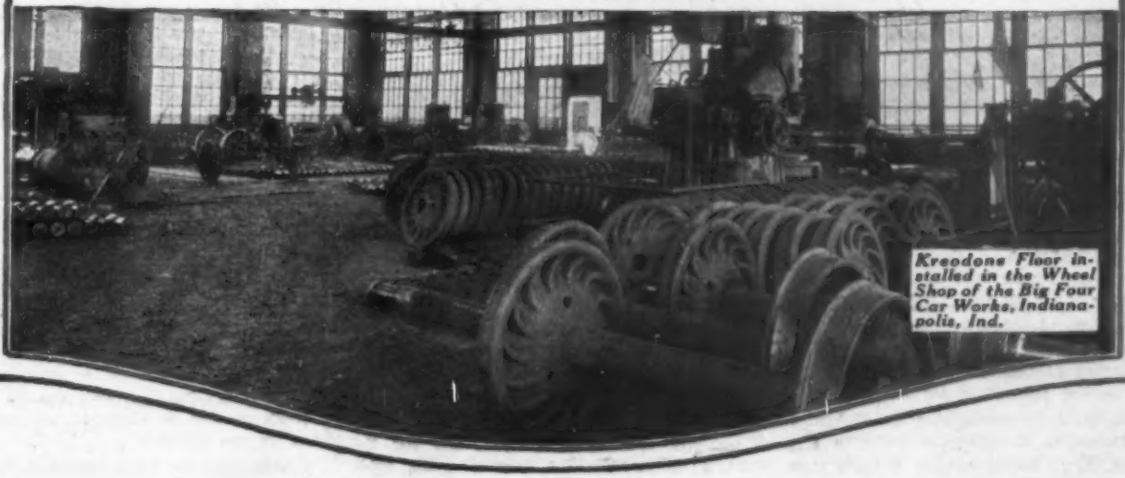
Get the *Genuine KREODONE* Blocks
Watch that Spelling—it means Service

REPUBLIC CREOSOTING COMPANY, Indianapolis, Ind.

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCH OFFICES:

315 Peoples Gas Bldg., Chicago
206 Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
Berkley Ward, Norfolk
222 Society for Savings Bldg., Cleveland
31 Transportation Bldg., Philadelphia
828 Plymouth Bldg., Minneapolis
445 Central Bldg., Seattle
Masonic Temple, Mobile
211 Hammond Bldg., Detroit



Kreodone Floor installed in the Wheel Shop of the Big Four Car Works, Indianapolis, Ind.

has let a contract for a 1-story machine shop, 80 x 220 feet.

CARNEGIE, PA.—The S. Keighley Co. will remodel the plant of the Adler Store Works for its own use.

CHESTER, PA.—The American Locomotive Co. is reportid planning to expend $1,000,000 in doubling the capacity of its steel castings plant here.

CONNELLSVILLE, PA.—The Connellsville Foundry, Machine & Steel Castings Co. plans to increase its capital from $150,000 to $250,000, and will enlarge its plant.

CONNELLSVILLE, PA.—The Pittsburgh-Connellsville Coal & Coke Co. recently was incorporated with $10,000 capital, by R. H. Soisson, M. Burns and H. F. Bonnals Jr.

ERIE, PA.—The Erie Motor Truck Mfg. Co. will build a plant. L. H. Heiman is director.

GREENSBURG, PA.—The Penn Aluminum Co., Pittsburgh, will build a plant here.

JOHNSTOWN, PA.—The Blum Safety Razor Co. has been incorporated with $50,000 capital, by T. J. Callete, Harry Silverstone and Harry Blum.

McKEESPORT, PA.—The Amper Iron & Metal Co. has been incorporated with $5000 capital, by Robert Amper, Thomas Amper and A. M. Amper.

PHILADEDPHIA.—A $65,000 factory, two stories, 75 x 180 feet, will be erected by the Sharples Specialty Co., manufacturer of separators.

PHILADELPHIA.—Approximately $3,000,000 will be expended here by Sears Roebuck & Co., Chicago, on three warehouses.

PHILADELPHIA.—The Wicaco Screw & Machine Works, Seventh and Wood streets, has acquired a site on which it plans to erect a plant to cost $100,000.

PHILADELPHIA.—The Hale & Kilburn Corp., Eighteenth and Lehigh streets, automobile bodies, has awarded a contract for a 5-story, 196 x 260-foot plant, to cost $100,000.

PITTSBURGH.—The A. Garrison Foundry Co. has awarded contracts for a foundry, 120 x 190 feet.

PITTSBURGH.—The Union Steel Casting Co. has plans for extensions and improvements to its foundry, to cost $27,400.

PITTSBURGH.—The Allegheny Gear Works has taken an option on a plot of land, 129 x 284 feet, and has awarded a contract for a building, 80 x 135 feet.

PITTSBURGH.—The Pittsburgh Gage & Supply Co., Liberty avenue, manufacturer of mechanical specialties, etc., has plans for a 6-story plant addition, 149 x 174 feet, to cost $150,000.

PITTSBURGH.—Four storage buildings, a pattern shop and several tank cars, were damaged recently by a fire which broke out in the plant of the Pittsburgh Model Engine Co. The loss was estimated at $200,000.

STRUDSBURG, PA.—The Pocomo Metal Mfg. Co. has started work on the erection of a new plant here.

EAST ORANGE, N. J.—Bonner & Hof, Inc., has been incorporated with $100,000 capital to manufacture automobiles, by E. N. Bonner, Jamaica, N. Y., and H. J. Hof, Newark, N. J.

HILTON, N. J.—Work will start shortly on the first unit of the proposed cutlery plant of the H. Boker Co., of New York. As one of the three units of the main factory there will be a 3-story building, 135 x 155 feet. There will also be a 1-story forge and hammer shop, 57 x 137 feet and a power house, 58 x 80 feet.

NEWARK, N. J.—The Die Casting Co. has awarded a contract for a plant addition.

NEWARK, N. J.—Leonard M. Randolph will erect a 1-story machine shop, 27 x 109 feet.

NEWARK, N. J.—A machine shop will be erected here by Leonard M. Randolph.

NEWARK, N. J.—Herman Podulsky is having plans drawn for an automobile body plant.

NEWARK, N. J.—A $66,000 factory, 4-stories, 60 x 80 feet, will be erected here by the General Electric Co.

NEWARK, N. J.—I. M. Griffiths, 41 Hamilton street, will erect a 2-story garage and machine shop, 57 x 107 feet, at an estimated cost of $30,000.

NEWARK, N. J.—The General Electric Co. will erect a 4-story plant, 60 x 80 feet at an estimated cost of $66,000.

NEWARK, N. J.—The Rose Mfg. & Machine Co., 111 Hamilton street, has been organized by Herman Rose and others.

NEWARK, N. J.—The Terminal Pattern & Model Works is having plans drawn for alterations to its plant.

NEWARK, N. J.—The L. Lawrence & Co., 292 Halsey street, copper-smithing works, has plans for a 1-story plant, 48 x 150 feet, to cost about $20,000.

NEWARK, N. J.—The Die Castings Co. of New Jersey has broken ground for a $25,000 plant addition. The building will be two stories, 50 x 90 feet.

NEWARK, N. J.—The Nick Electric Mfg. Co., electrical manufacturer, recently was incorporated with $50,000 capital, by Albert Nick, A. B. Gutman and J. R. McClear.

NEWARK, N. J.—The Tanners Machine Co. has been incorporated with a capital of $100,000 to manufacture machinery. The incorporators are Ralph G. and Lawrence J. Steinhardt, James Brown and Charles Hanko.

PERTH AMBOY, N. J.—The Perth Amboy Dry Dock Co. contemplates a plant addition.

NORFOLK, VA.—The Norfolk Electric Mfg. Co. will build a plant. P. O. Sutton, 215 Cumberland street, is general manager.

RICHMOND, VA.—The Southern Stove Works, Hermitage and Leigh streets, has plans for a plant for the manufacture of stoves. The company is capitalized at $500,000.

Central States Activity

CRANDON, WIS.—The Vulcan Last Co., Portsmouth, O., will erect a 1-story addition, 30 x 200 feet and a shipping building, 100 x 100 feet.

CHILTON, WIS.—The Aluminum Specialty Co. has awarded contracts for a factory and power house, 2-stories, 60 x 200 feet, to cost $40,000.

CHIPPEWA FALLS, WIS.—The Yates & Johnson Co. plans a foundry, 125 x 200 feet, at an estimated cost of $75,000.

CHIPPEWA FALLS, WIS.—E. G. Pannier & Sons, farm machinery and agricultural implements, plans a shop addition, 125 x 200 feet, costing about $100,000 with additional equipment.

EAU CLAIRE, WIS.—The Rosholt Machine Co. will spend $20,000 to $25,000 in erecting a machine shop addition and installing additional machinery for manufacturing gas engines, railroad service cars and similar machines. K. Rosholt is president.

BAY CITY, MICH.—Construction of a new plant for the Union Truck Co. has been started.

DETROIT.—The Paige-Detroit Motor Car Co. is taking bids for a machine shop, 275 x 528 feet.

DETROIT.—The Parish Mfg. Co. has awarded a contract to the Austin Co. for an addition, 98 x 260 feet, to cost $55,000.

DETROIT.—The Austin Co. has a contract to erect an addition, 60 x 100 feet, to the plant of the Standard Screw Products Co.

CHICAGO.—The American Car & Foundry Co. will build an addition.

CHICAGO.—The Standard Oil Co. plans a machine shop, 1-story, 50 x 160 feet, to cost $50,000.

CHICAGO.—The Hurley Machine Co. has increased its capital and is reported planning to enlarge its plant.

CHICAGO.—The Whitman & Barnes Co. has a permit to erect a power house at an estimated cost of $100,000.

CHICAGO.—Architect John D. Chubb, 109 North Dearborn street, is drawing plans for a power house for the City National Bank, Battle Creek, Mich.

INDIANAPOLIS.—The Lockhart Mfg. Co. has been incorporated with $20,000 capital to manufacture tank heaters, by Howard Lockhart, L. I. Cornell, M. Cornell and M. Lockhart.

INDIANAPOLIS.—A new automobile company headed by McCall White and E. O. Howard, Detroit, formerly of the Cadillac Motor Car Co., will within a few days, according to a report, take over the plant of the Stenotype Co., Kentucky avenue, which it will utilize for the manufacture of automobiles.

MICHIGAN CITY, IND.—The Perfective Machine Co. is having plans prepared for a foundry, 60 x 100 feet, to cost $50,000.

MICHIGAN CITY, IND.—A. V. Caprano, architect, 923 Blue Island avenue, is preparing plans for a manufacturing plant and boiler house, 1-story, 72 x 127 feet, to cost $22,000. The name of the owner is withheld.

MUNCIE, IND.—The General Motors Corp. is reported planning to erect new factory buildings here.

NEW ALBANY, IND.—The Gohmann Bros. & Kahler, operating a stove foundry here, are building an addition, 60 x 174 feet.

SHERIDAN, IND.—The Sheridan Cutlery Co., capitalized at $50,000, has been chartered to manufacture cutlery by Theodore Pettijohn, president, and Maurice Mendenhall, secretary.

UNION CITY, IND.—The Union City Wheel Works plans a 2-story plant addition, 50 x 72 feet, to cost about $25,000.

VALPARAISO, IND.—The McGill Mfg. Co., electrical supplies, contemplates a plant, 3-stories, 65 x 260 feet, to cost $150,000.

AMHERST, O.—A foundry company, capitalized at $75,000, and backed by Elyria, O., interests, is reported to have taken an option on a plant site here. No details have been given out.

CINCINNATI.—The Modern Foundry Co. has awarded contracts for a pattern storage building, 4-stories, 60 x 160 feet, to cost $55,000.

CINCINNATI.—The Cincinnati Milling Machine Co. has had plans prepared for an addition, 5-stories, 70 x 175 feet.

CLEVELAND.—The Ohio Machine & Boiler Co. contemplates a power plant, 55 x 58 feet.

CLEVELAND.—The Auto Carriage Co. plans a plant, 3-stories, 60 x 400 feet, to cost $300,000.

CLEVELAND.—The Champion Machine & Forging Co. has awarded contracts for enlargements to its plant.

CLEVELAND.—The Metals Plating Co. has awarded a contract for a plant, 1-story, 34 x 90 feet, to cost $15,000.

CLEVELAND.—The F. H. Bultman Co. has awarded a contract for a machine shop, 1-story, 84 x 112 feet, to cost about $35,000.

CLEVELAND.—The Lang Body Co. has taken out a permit to erect an automobile body manufacturing plant, to cost $200,000.

CLEVELAND.—The Fulton Foundry & Machine Co.,

1209 Marquette road, has awarded a contract for a plant addition, 100 x 111 feet, to cost $70,000.

CLEVELAND.—The International Steel Tube & Rolling Mills, Inc., Leader-News building, has selected a site and will erect a plant soon.

CLEVELAND.—The Enamel Products Co., 341 Eddy road, has awarded a contract for a 2-story, 40 x 180-foot plant addition to cost $10,000.

CLEVELAND.—The Cleveland Metal Products Co has awarded a contract for a warehouse, to the Austin Co. The building will be 60 x 142 feet.

CLEVELAND.—The Osborn Engineering Co. is drawing plans for a machine shop, 1-story, 135 x 200 feet, for the Ball Engine Co., Erie, Pa., to cost about $75,000.

CLEVELAND.—The Standard Equipment Co., Lorain avenue and West 106th street, automobile specialties, is reported planning a plant addition, 2-stories, 75 x 100 feet, to cost $25,000.

CLEVELAND.—The J. W. Murray Mfg. Co., Detroit, J. W. Murray, president, is reported planning a branch plant in this city for the manufacture of sheet metal products and specialties.

CLEVELAND.—The Lake Erie Steel & Wire Co., which recently increased its capital from $75,000 to $225,000, plans to enlarge its plant by an addition, 50 x 180 feet, and to install additional equipment for the manufacture of cold drawn steel.

CLEVELAND.—The Automobile Equipment Co., Blackstone building, has awarded contracts for a 2-story, 65 x 100-foot plant, estimated to cost $60,000.

CLEVELAND.—The Collinwood Foundry & Mfg. Co. has been incorporated with $150,000 capital, by D. J. Zinner, F. F. Spurney, E. M. Chaloupke and C. J. Zinner, 312 Society for Savings building.

DAYTON, O.—The Dayton Pipe Coupling Co. is erecting an addition, 1-story, 90 x 120 feet.

DAYTON, O.—The Efficiency Tool Co., capitalized at $10,000, recently was incorporated by William H. Carroll, Edward B. Glaser, Harry P. Roennecke, John B. Rettich and William H. Collins.

DAYTON, O.—Part of the plant of the Dayton Malleable Iron Works recently was damaged by fire. The loss has been estimated at $50,000.

DELPHOS, O.—Contracts have been awarded to the the H. K. Ferguson Co., Cleveland, for an addition to the plant of the American Road Machinery Co.

ELYRIA, O.—The Northington Ball Co. will take bids soon for a plant addition to cost about $70,000.

ELYRIA, O.—The American Crucible Products Co. recently was incorporated with $50,000 capital, by L. B. Fauver, B. L. Farmer, F. L. Hamel, J. W. Schmauch and H. A. Daniels.

HAMILTON, O.—The H. P. Deuscher Co. has plans for a foundry addition to include a core room, 1-story, 45 x 60 feet, to cost $30,000.

LORAIN, O.—The Steel Stamping Co. plans a plant, 1-story, 50 x 130 feet, to cost $30,000.

LORAIN, O.—The old plant formerly operated by the Brown-Cochran Co. has been sold to the Aetna Steel Casting Co., Cleveland, which plans to install two furnaces for the production of large and small castings.

MANSFIELD, O.—The Westinghouse Products Co. has awarded a contract for a plant addition, 3-stories, 100 x 150 feet, to cost $15,000.

MASSILLON, O.—Work on a plant for the Beans Spring & Mfg. Co., which was recently organized, has been started. The plant will consist of two buildings, 80 x 360 feet and 80 x 250 feet. Automobile springs will be manufactured. J. F. Beans is president.

MINERAL RIDGE, O.—The Ohio Steel Products Co. has started work on a plant, to cost $65,000.

NORTH CANTON, O.—The Hoover Suction Sweeper Co. is having plans drawn for a plant addition, 4-stories, 80 x 170 feet, to cost $125,000.

SANDUSKY, O.—The Ohio State Rubber Tire Co. is taking bids for a power plant and machine shop.

SPRINGFIELD, O.—The Thompson Grinder Co. has plans for a factory and office building, 1-story, 62 x 200 feet, to cost $60,000.

TOLEDO, O.—The Automobile Cylinder Regrinding Co. recently was incorporated with $5000 capital, by L. A. Foley, M. A. Foley and others.

TOLEDO, O.—Work has started on a $100,000 plant for the Lewis Steel Products Co., valve manufacturer. The main buildings will consist of a foundry, 80 x 300 feet, a machine shop of the same dimensions and a 2-story office building. A. R. Clas is president.

COVINGTON, KY.—This city proposes to put in a new pump at the Fort Thomas waterworks plant.

HARRODSBURG, KY.—The Bohon Buggy Co. proposes to build an addition to cost $65,000.

MOUNDSVILLE, W. VA.—Work is progressing on a plant for the Cameron Tool Co.

WHEELING, W. VA.—The J. E. Moss Iron Works is reported planning a plant addition, 120 x 240 feet, and an office building addition, three stories, 25 x 100 feet.

ANDERSON, IND.—The Anderson Foundry & Machine Works contemplates a plant addition, 2-stories, 80 x 200 feet, to cost $75,000.

ANDERSON, IND.—The plant of the Spring-Steel Fence & Wire Co. will be moved to Mason City, Iowa, according to a current report.

BRAZIL, IND.—J. M. Cutshall & Sons have the contract to erect a heating plant for the city.

Business Changes

INCREASED business has caused the Fairbanks Co. to move its Boston branch house from Pearl and Franklin streets to 374 Congress street, South Boston, Mass.

* * *

The J. E. F. Spark Plug Co., 1826 Brown street, Milwaukee, has completed a new machine shop and in moving into its new quarters. The company has changed its name to Viktry Mfg. Co., and the name of the J. E. F. Sales Corp. to Viktry Sales Co.

* * *

Bethlehem Fabricators, Inc., Bethlehem, Pa., formerly the Guerber Engineering Co., has opened a New York office at room 1106 at 505 Fifth avenue.

* * *

The Carborundum Co., Niagara Falls, N. Y., has opened a new sales office and warerooms in the Burkhardt building, Second and Larned streets, Detroit, in charge of A. Dobson, formerly manager of the Montreal office of the company.

* * *

The Emerman Co. and the Erie Iron & Metal Co., dealers in iron and steel scrap, have opened joint offices in the American Trust bldg., Cleveland, in charge of Harvey Emerman, president, and Lewis B. Emerman, vice president. The main offices of these companies will continue at Erie, Pa., in charge of Leo A. Weil and Albert Emerman.

Business in Canada

WINNIPEG, MAN.—The Tavani Electric Steel Co., Ltd., Belleville, Ont., contemplates a steel foundry here at an estimated cost of $5,000,000.

SYDNEY, N. S.—The Dominion Iron & Steel Corp. contemplates enlarging the capacity of its open hearth plant.

TRURO, N. S.—The city will build an addition to its electric lighting plant.

MONTREAL, QUE.—The Anglo Canadian Wire Works, Ltd., has awarded contracts for a plant here. Hutchison & Wood, 2 Place D'Armes, are architects.

MONTREAL, QUE.—The Dominion Appliances, Ltd., have been incorporated with $10,000 capital, to manufacture gears, equipment for railway cars, locomotives, etc.

MONTREAL, QUE.—Leger, Lavoie, Ltd., have been incorporated to manufacture automobiles, motor vehicles, engines, etc., with $100,000 capital, by Edouard E. Leger, Louis Dupuis, Napoleon F. Lavoie and others.

QUEBEC, QUE.—The International Paper Co., Ltd., Three Rivers, Que., is erecting a manufacturing plant here. The power plant will cost $15,000.

BELLEVILLE, ONT.—The Tivani Steel Co. plans a steel plant here. A. P. Gillies, room 1950, 50 Church street, New York, is interested.

BRANTFORD, ONT.—John Bishop & Son, Ltd. have been incorporated to manufacture hardware, tools, iron, steel and metal products, with $100,000 capital, by Francis J. Bishop, George D. Heyd and others.

CHATHAM, ONT.—Plans are being prepared for the construction of a filtration plant here to cost $200,000.

CHATHAM, ONT.—The Dowsley Spring & Axle Works has awarded a contract for a plant, to cost $80,000.

FT. FRANCES, ONT.—The International Insulating Co. plans a plant.

GUELPH, ONT.—The International Malleable Iron Co., Beverley street, has awarded a contract for an addition.

LONDON, ONT.—The London Concrete Machinery Co., is building an addition.

LONDON, ONT.—The utilities commission is having plans prepared for a hydro substation to cost $14,000.

OSHAWA, ONT.—Plans and specifications are with B. H. Prack, Lumsden building, Toronto, Ont., who is receiving tenders for five buildings to be erected here for the Pedlar People, Ltd., manufacturers of sheet metal products, etc. The building will be two stories, 80 x 360 feet, two stories, 80 x 365 feet, two stories, 70 x 285 feet, one story, 60 x 285 feet, and one story, 70 x 250 feet.

SARNIA, ONT.—The International Bushings, Ltd., which was recently incorporated, contemplates a manufacturing plant. C. E. Calvert is president.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ores

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Warehouse Prices

Steel bars, Boston	3.40c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.37c
Steel bars, Detroit	3.33c
Steel bars, Philadelphia	3.60c
Steel bars, New York	3.37c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.33c
Steel bars, St. Paul	3.505c
Steel bars, Buffalo	3.45c
Iron bars, Boston	3.40c
Iron bars, Buffalo	4.15c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.33c
Iron bars, Philadelphia	3.60c
Iron bars, New York	3.37c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	3.50c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.37c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.55c
Shapes, Cincinnati	3.43c
Plates, Buffalo	3.75c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.70c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.57c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.63c
No. 10 blue anl. sheets, N. Y.	4.82c
No. 10 blue anl. sheets, Chicago	4.57c
No. 10 blue anl. sheets, Cleveland	3.80c
No. 10 blue anl. sheets, Boston	4.85c
No. 10 blue anl., Buffalo	4.65c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.53c
No. 10 blue anl. sheets, St. Paul	4.795c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c
No. 28 black sheets, New York	5.75c
No. 28 black sheets, Cleveland	4.60c
No. 28 black sheets, Boston	5.90c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.695c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	5.70c
No. 28 galv. sheets, Chicago	6.97c
No. 28 galv. sheets, New York	7.00c
No. 28 galv. sheets, Boston	7.10c
No. 28 galv. sheets, Cleveland	5.95c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.05c
No. 28 galv. sheets, St. Louis	7.045c
Bands, Boston	4.60c
Bands, Detroit	4.03c
Hoops, Boston	4.70c
Hoops, Detroit	4.03c
Cold rolled shafting and screw stock, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches ide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long.

Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28, 30 and 36 inches wide by 72, 84, 96 and 120 inches long.

Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 0c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.

Lengths—72-84-96-120 and 144 inches.

Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44
Lap Weld		
2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42
2-inch	48½	36
Lap Weld		
2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44
Lap Weld		
2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37
Lap Weld		
2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black.	Galv.
⅛ and ¼-inch	29½	2½
⅜-inch	30½	3½
½-inch	34½	16½
¾ to 1½-inch	39½	23½
Lap Weld		
2-inch	32½	18½
2½ to 6-inch	34½	21½
7 to 12-inch	31½	18½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼, ⅜-inch	28½	11½
½-inch	33½	20½
¾ to 1½-inch	39½	24½
Lap Weld		
2-inch	33½	20½
2½ to 4-inch	35½	22½
4½ to 6-inch	34½	22½
7 and 8-inch	26½	14½
9 and 12-inch	21½	9½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Black	Galv.
½-inch	20½	8½
¾ to 1½-inch	25½	13½
Lap Weld		
2-inch	20½	8½
2½ to 4-inch	22½	13½
4½ to 6-inch	21½	12½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16

Electric Steels

SILICO-CHROME MANGANESE

SPRING STEEL ROLLED BILLETS

DIE BLOCKS

PISTON RODS

FORGED AND HEAT TREATED

FORGED CAR AXLES

Heat Treated

Superior Properties

Write for data

HAMMERED TOOL STEEL BARS

BEARING STEELS

GENERAL STEEL COMPANY

Public Service Building **MILWAUKEE, WISCONSIN**

DETROIT REPRESENTATIVE: D. J. Crowley, 832 Dime Bank Building

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$20.00 to 20.50
Chicago	18.50 to 19.00
Eastern Pennsylvania	18.50 to 19.50
Cleveland	19.00 to 19.50
St. Louis	18.00 to 18.50
Buffalo	19.00 to 20.00
New York (dealers' prices)	15.00 to 15.50
Cincinnati	16.50 to 17.00
Birmingham	20.00 to 21.00
Valleys	19.50 to 20.00
Boston (dealers)	15.00 to 15.50

BUNDLED SHEETS

Pittsburgh	$15.50 to 16.00
Eastern Pennsylvania	15.00 to 16.00
Cleveland	14.50 to 15.00
Buffalo	14.50 to 15.00
Cincinnati	12.50 to 13.00
St. Louis	11.50 to 12.00

STEEL RAILS, SHORT

Chicago	$19.50 to 20.00
Boston (dealers)	15.50 to 16.00
Cleveland	18.00 to 18.50
St. Louis	21.50 to 22.00
Birmingham	19.00 to 20.00
Cincinnati	18.50 to 19.00

STOVE PLATE

Pittsburgh	$19.00 to 20.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	20.50 to 21.50
Cleveland	18.75 to 19.00
St. Louis	22.00 to 22.50
Buffalo	22.00 to 22.50
New York	17.50 to 18.00
Cincinnati	16.50 to 17.00
Birmingham	20.00 to 21.00
Boston	21.00 to 22.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$24.00 to 25.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	26.50 to 27.00
Buffalo	23.50 to 24.00

SHOVELING STEEL

Chicago	$17.50 to 18.00
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$21.00 to 21.50
Chicago	20.50 to 21.00
St. Louis	20.50 to 21.00

BALED SHEETS

Pittsburgh	$18.00 to 18.50
Chicago	14.50 to 15.00

FROGS, SWITCHES, GUARDS

Chicago	$18.50 to 19.00
St. Louis	18.50 to 19.00
Eastern Pennsylvania	18.00 to 19.00

BOILER PLATE, CUT

Chicago, No. 1	$15.50 to 16.00
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	$20.00 to 21.00
St. Louis	17.50 to 18.00

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$23.00 to 24.00
Pittsburgh, No. 2	22.00 to 23.00
Chicago, No 1	21.00 to 21.50
Chicago, No. 2	18.75 to 19.00
Eastern Pennsylvania, No. 1	27.00 to 28.00
Cleveland, No. 1	23.25 to 23.75
St. Louis, No. 1	20.00 to 20.50
St. Louis, No. 2	19.00 to 19.50
Buffalo	23.00 to 23.50
Cincinnati, No. 1	19.50 to 20.00
Birmingham, No. 1	17.00 to 18.00
New York, No. 1 (dealers)	23.00
Boston (dealers)	18.50 to 19.00

WROUGHT PIPE

Eastern Pennsylvania	$19.50 to 20.50
Eastern Pennsylvania, ungraded	13.00 to 14.00
Buffalo	17.50 to 18.00
New York (dealers)	15.00 to 15.50
Boston (dealers)	15.50 to 16.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$22.00 to 23.00

CITY WROUGHT

New York, long (dealers)	19.00 to 19.50

BUSHELING

Chicago, No. 1	$17.50 to 18.00
Chicago, No. 2	12.00 to 12.50
Cleveland, No. 1	17.50 to 18.00
Cleveland, No. 2	14.50 to 15.00
St. Louis, No. 1	17.50 to 18.00
Buffalo, No. 1	16.50 to 17.50
Cincinnati, No. 1	14.50 to 15.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

MACHINE SHOP TURNINGS

Pittsburgh	$12.50 to 13.00
Chicago	9.00 to 9.50
Eastern Pennsylvania	15.00 to 16.00
Eastern Pennsylvania (blast furn.)	13.00 to 14.00
Cleveland	10.75 to 11.00
Buffalo	12.00 to 12.50
New York (dealers' price)	11.00 to 11.50
St. Louis	9.50 to 10.00
Cincinnati	7.50 to 8.00
Birmingham	13.00 to 14.00
Valleys	12.00 to 12.75
Boston (dealers)	10.00 to 10.50
Boston (blast furnace) (dealers)	10.50 to 11.00

CAST IRON BORINGS

Pittsburgh	$15.50 to 16.00
Chicago	12.50 to 13.00
Eastern Pennsylvania	16.00 to 17.00
Cleveland	14.00 to 14.25
St. Louis	11.50 to 12.00
Buffalo	13.50 to 14.00
New York (dealers' price)	12.00 to 12.50
Cincinnati	9.00 to 9.50
Birmingham	13.00 to 14.00
Valleys	14.75 to 15.00
Boston (dealers)	11.50 to 12.00
Boston (blast furnace) (dealers)	11.00 to 11.50

IRON AXLES

Pittsburgh	$34.00 to 35.00
Chicago	31.00 to 32.00
Eastern Pennsylvania	35.00
Cleveland	27.00 to 28.00
St. Louis	31.00 to 31.50
Buffalo	28.00 to 29.00
Cincinnati	23.00 to 23.50

IRON RAILS

Chicago	22.50 to 23.00
Cleveland	27.00 to 28.00
St. Louis	22.50 to 23.00
Buffalo	24.00 to 25.00
Cincinnati	23.00 to 23.50

PIPES AND FLUES

Chicago	16.50 to 17.00
Cleveland	17.00 to 17.50
St. Louis	15.50 to 16.00
Cincinnati	15.00 to 15.50

GRATE BARS

Chicago	$20.00 to 20.50
Cleveland	19.00 to 19.25
Buffalo	20.00 to 20.50
New York	16.50 to 17.00
Eastern Pennsylvania	18.50 to 19.50

FORGE FLASHINGS

Cleveland, large	$14.00 to 14.50
Cleveland, small	16.50 to 17.00
Chicago, small	14.00 to 14.50
Boston (dealers)	12.00 to 12.50

FORGE SCRAP

Chicago	$18.50 to 19.00
Eastern Pennsylvania, No. 1	14.50 to 15.50
Boston	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago	23.00 to 23.50
St. Louis	21.50 to 22.00

ANGLE BARS—IRON

Chicago	$22.50 to 23.00
St. Louis	23.50 to 24.00

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$16.00 to 17.00
Eastern Pennsylvania	16.00 to 17.00
Boston (dealers)	11.50 to 12.00
St. Louis	12.50 to 13.00
Cleveland	15.75 to 16.00
Buffalo	16.00 to 17.00
Chicago	14.00 to 14.50

STEEL CAR AXLES

Pittsburgh	$26.00 to 27.00
Eastern Pennsylvania	32.00
Cleveland	34 00 to 35.00
St. Louis	29.00 to 29.50
Buffalo	28.00 to 29.00
Chicago	28.00 to 28.50
New York (dealers)	24.00 to 25.00
Birmingham	21.00 to 22.00
Boston (dealers)	24.50 to 25.00

SHAFTING

Eastern Pennsylvania	$26.00 to 28.00
St. Louis	28.00 to 28.50
New York (dealers' price)	21.00 to 22.00
Chicago	25.00 to 25.50

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh, iron	$25.00 to 25.50
Pittsburgh, steel	21.50 to 22.00
Chicago, iron	22.50 to 23.00
Eastern Pennsylvania, iron	24.50 to 25.00
Cleveland, iron	22.25 to 22.75
St. Louis, iron	22.50 to 23.00
Buffalo, iron	22.50 to 23.50
Birmingham, iron	20.00 to 21.00
Birmingham, tram car	19.00 to 20.00
Boston	23.00 to 24.00
Cincinnati	21.00 to 21.50

NO. 1 CAST SCRAP

Pittsburgh, cupola	$25.00 to 26.00
Chicago, cupola	25.50 to 26.00
Eastern Pennsylvania, cupola	24.50 to 25.50
Cleveland, cupola	22.75 to 23.00
New York, cupola (dealers' price)	22.50 to 23.00
Cincinnati, No. 1, cupola	21.50 to 22.00
Birmingham, cupola	24.00 to 25.00
St. Louis, railroad	26.50 to 27.00
St. Louis, agricultural	26.00 to 26.50
Buffalo	24.50 to 25.00
Boston	28.00 to 29.00
Valleys	22.75 to 23.00

HEAVY CAST

New York (dealers)	21.50 to 22.00
Buffalo	21.00 to 22.00
Pittsburgh	22.00 to 23.00
Cleveland	17.25 to 17.50
Boston	19.00 to 19.50

MALLEABLE

Pittsburgh, railroad	$21.00 to 22.00
Pittsburgh, agricultural	20.00 to 21.00
Chicago, railroad	19.50 to 20.00
Chicago, agricultural	20.00 to 20.50
Eastern Pennsylvania, railroad	20.00 to 21.00
Cleveland, railroad	20.00 to 21.50
Cleveland, agricultural	17.50 to 18.00
St. Louis, railroad	17.00 to 17.50
St. Louis, agricultural	16.50 to 17.00
Cincinnati, railroad	15.00 to 15.50
Cincinnati, agricultural	14.50 to 15.00
Boston	19.50 to 20.50
Buffalo	19.00 to 20.00

Miscellaneous Scrap

Gross Tons Delivered to Consumer

RE-ROLLING RAILS

5 feet and over

Pittsburgh	$25.00 to 26.00
Chicago	25.00 to 25.50
Eastern Pennsylvania	Nominal
Cleveland	26.00 to 27.00
St. Louis	25.00 to 26.50
Birmingham	22.00 to 23.00
Boston (dealers)	20.00 to 20.50

LOCOMOTIVE TIRES

Chicago	19.00 to 19.50
St. Louis	20.00 to 20.50

BOILER PUNCHINGS

Chicago	$21.50 to 22.50
Eastern Pennsylvania	23.00 to 24.00

Shipments from Stock ——

—— Government material at

prices ~~lower~~ under present card quotations.

1500	tons	Billets	$7\frac{29}{32}$
2000	"	Shell	3" - $4\frac{1}{2}$" - 6" - 9"
1000	"	Tie Bars	$\frac{5}{8}$ + 3"
800	"	Ingots for	$9\frac{2}{2}$" Shell
100	"	C.R. Bessemer Rounds	$1\frac{9}{32}$

Ask for prices on these, also let us know what other grades you need, or have for sale.

The James S. Miller Co.
McCormick Bldg
Chicago.

New Trade Publications

FIRE DOORS.—The Merchant & Evans Co., Philadelphia, is circulating a catalog in which fire doors, shutters and ventilators are described and illustrated. Specifications are given as well as a list of users of the company's various products.

METALS.—Descriptions and analyses of the various grades of slab zinc are given in a 12-page booklet recently published by the New Jersey Zinc Co., New York. Mention is also made in the booklet of spiegeleisen and bullion.

BUILDING CONSTRUCTION.—A 40-page booklet designed to illustrate and explain the equipment used and the methods employed in the construction of modern buildings under a system developed by the Blaw-Knox Co., Pittsburgh, is being circulated by that company. The booklet is profusely illustrated.

PIGMENTS.—A 12-page booklet devoted to a description of the various pigments manufactured by the New Jersey Zinc Co., New York, has been issued to the trade. The different brands are described in detail and the different uses to which they are put are given.

FURNACE INSULATION.—The Celite Products Co., New York, recently issued an interesting bulletin describing in detail, standard engineering practices in insulating, annealing, heating, forging, malleable, gun, glass, and other type of furnaces. Several illustrations are presented.

CHEMICALS.—Under this title the New Jersey Zinc Co., New York, has published a booklet describing the various grades of sulphuric acid produced by the company, as well as muriatic acid, zinc chloride, salt cake, etc. The booklet contains an illustration of the company's general offices.

ROLLED ZINC.—The uses and characteristics of rolled zinc are featured in an 8-page booklet being circulated by the New Jersey Zinc Co., New York. The uses to which this material is put are given and include its use for boiler plates, building hardware, screens, shingle nails, machine plates, etc. Several illustrations are given.

ZINC DUST.—This material is described in an 8-page booklet recently published by the New Jersey Zinc Co., New York. Two grades are described in detail, one being said to contain 95 per cent metallic zinc, while the metallic zinc content of the other averages between 92 and 94 per cent. The uses to which this material can be put are given.

POWDERED COAL.—The Combustion Economy Corp., Chicago, is circulating a bulletin in which the history and the possibilities of using powdered coal as a fuel are described. Types of furnaces, draft, preparation of powdered coal for burning, storage, separation of scrap iron from coal, crushing, drying, distributing to furnaces, air supply, control, carburization and adaption to furnaces, are some of the points in the use of this fuel, which are enumerated. A line drawing of a powdered coal burning system is also given.

LOCOMOTIVE CRANES.—The Edward F. Terry Mfg. Co., New York, recently issued a catalog describing its locomotive crane for contractor's use. The catalog is illustrated and the crane is fully described. It is pointed out that the crane is built to withstand the severe duty imposed on a locomotive crane by contractors and material handlers. The frame and platform are built of heavy section steel and all working parts are proportioned to withstand hard usage. The catalog gives information on the mounting of cranes and several of the illustrations show the cranes in actual use.

TOOL GRINDER.—In a 4-page leaflet circulated by Alfred Herbert, Ltd., Coventry, England, and New York, an oscillating tool grinder is described and illustrated. In this grinder the grinding wheel oscillates rapidly past the tool, which is always in full view. Grinding may be performed with or without water. A fan connected to a streamline duct in the base of the toolholder, draws all dust and chips away. The wheel spindle, self-contained countershaft, loose pulley and all shafts in the gear box with the exception of the eccentric shaft, run on ball bearings. The eccentric shaft runs in plain bearings. Other parts of the tool are described.

SUBSTATIONS.—Railway converter substations are extensively treated in an attractive 36-page illustrated booklet recently published by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The booklet contains a compilation of ideas for operating engineers' experience in substation work. The illustrations which accompany the various descriptions are clear and the descriptions are concise and comprehensively written. Many of the illustrations are of actual installations. The booklet is especially intended for electric railway engineers, but should be of interest to others interested in electrical equipment, etc.

ROCK CRUSHER.—Bulletin 1456, recently published by the Allis-Chalmers Mfg. Co. of Milwaukee, contains descriptions and illustrations of a rock crusher which the company manufactures. According to the booklet, the crusher contains a fixed and moving crushing element. The stationary element consists of a curved anvil, the crushing surface of which is lined with chilled iron wearing plates. The anvil is held in position in relation to the frame by steel tie-rods co-acting against springs, which take up or equalize excessive shocks and pressure. Acting against this anvil is a roll with removable teeth, which is mounted on a heavy shaft running in massive journals. This roll is so located with relation to the anvil that preliminary fracturing of pieces of rock is effected by the sledging action of the teeth of the rotating roll on the pieces as they rest by gravity upon the roll. The descriptions of the various types are thorough and the illustrations give the reader a comprehensive idea of the equipment.

STANDARDIZED BUILDINGS.—The Milliken Bros. Mfg. Co., New York, has published a descriptive catalog in which structures designed by the company under the standardized truss unit system are described and illustrated. These building are all-steel and are furnished complete with doors, skylights, etc. They are suitable for all classes of industrial and manufacturing structures. The booklet contains illustrations of buildings of this type erected for the United States government and large manufacturers. One section is devoted to transmission towers, radio towers and special poles, which the company also builds. A companion booklet also has been issued by the company. This booklet forms a guide to the construction of buildings from foundation to roof.

DRUM CONTROLLERS.—A 4-page two-color folder has been prepared by the Cutler-Hammer Mfg. Co., Milwaukee, in which the outstanding features of drum controllers manufactured by the company are described and illustrated. The accessibility, interchangeability of parts and interchangeability of methods of manipulation are among the features given prominence. Other points described include how the contact fingers and the cylinders may be removed, metal construction and the straight nonstubbing fingers with which the controller is equipped. Dimensions, ratings and other data are given. The bulletin was prepared especially for the St. Louis convention of the Association of Iron and Steel Electrical Engineers, but is also being circulated to those interested in this line of electrical equipment.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg. Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

A firm in China desires to purchase and secure an agency for the sale of canned goods, wire nails, metals, new and scrap piece goods, etc. Opportunity No. 30538.

A merchant in Czechoslovakia desires to purchase and secure an agency for the sale of chemicals, sewing machines, typewriters, safety razors, etc. Opportunity No. 30580.

The purchase of enameled wire is desired by a firm in Switzerland. Opportunity No. 30680.

A firm in Belgium desires to purchase castors and fittings for wheelbarrows, car movers, trucks with lifting gear and portable lifting appliances. Opportunity No. 30584.

A commercial agent in Czechoslovakia desires to purchase and secure an agency for the sale of electrical measuring instruments, electric meters, installation material, telephone equipment, bells, etc. Correspondence may be in English. Opportunity No. 30633.

An American firm with an established branch in Australia desires an agency for the sale of hardware, tools, novelties, cutlery, enamelware, etc. Opportunity No. 30688.

A firm in China desires to purchase a paper mill plant and requires 15 and 20-ton capacity machines. Quotations should be forwarded as soon as possible. Opportunity No. 30691.

The purchase of a machine for perforating rolls for mechanical pianos is desired by a party in Spain. Correspondence should be in Spanish. Opportunity No. 30707.

Catalogs, price lists, instructions, etc., of machinery for knitted goods, are desired by a party in New Zealand. Opportunitw No. 30708.

A party in Peru desires to obtain catalogs of all kinds of office furniture, fixtures and supplies, adding machines, typewriters, safes, etc. Opportunity No. 30709.

A commission agent in England desires to represent manufacturers in Russia, Finland, Poland, Siberia, Scandinavia, France and Great Britain, in the sale of machinery, typewriters and tobacco-making machinery.